

SEQUENCE LISTING

<110>	Andrew Bett Volker Sandig Rima Youil		
	IMPROVED HELPER DEPENDENT VECTOR SYSTEM GENE THERAPY		
<130>	20377YP		
	09/890,836 2001-08-03		
	PCT/US00/02405 2000-01-31		
	60/138,134 1999-06-08		
	60/118,601 1999-02-04		
<160>	17		•
<170>	FastSEQ for Windows Version 4.0		
<210> <211> <212> <213>	15		
<220> <223>	Consensus sequence		
<222>	misc_feature (1)(15) n = A,T,C or G		
<400> atttgr	1 nnnnn nnncg	15	
<210><211><212><213>	10		
<220> <223>	Adenovirus 5		
<400> attttg			10
<210><211><211><212><213>	10		
<220> <223>	Consensus sequence		

<400> 3 attttgttgt	10
<210> 4 <211> 158 <212> DNA <213> Artificial Sequence	
<220> <223> Synthetic packaging signal	
<400> 4 gtacacagga agtgactttt aacgcgcggt ttgttacgga tgttgtagta aatttgtcta gggccgagta agatttgacc gtttacgcgg ggactttgaa taagagcgag tgaaatctga ataattttgt tgtactcata gcgcgtaatc tctagacg	60 120 158
<210> 5 <211> 158 <212> DNA <213> Artificial Sequence	
<220> <223> Adenovirus 5	
<400> 5 gtacacagga agtgacaatt ttcgcgcggt tttaggcgga tgttgtagta aatttgggcg taaccgagta agatttggcc attttcgcgg gaaaactgaa taagaggaag tgaaatctga ataattttgt gttactcata gcgcgtaatc tctagacg	60 120 158
<210> 6 <211> 65 <212> DNA <213> Artificial Sequence	
<220> <223> Linker	
<400> 6 agctcggccg attattggcg cgccagatct gcggccgctt ctagaaacgc gtgaattcgg cgcca	60 65
<210> 7 <211> 65 <212> DNA <213> Artificial Sequence	
<220> <223> Linker	
<400> 7 agcttggcgc cgaattcacg cgtttctaga agcggccgca gatctggcgc gccaataatc ggccg	60 65
<210> 8 <211> 40 <212> DNA <213> Artificial Sequence	
<220> <223> PCR Primer	
<400> 8	

attggcgcgc cttctttctg ggatgattca gcatcaactc	40
<210> 9 <211> 41 <212> DNA <213> Artificial Sequence	
<220> <223> PCR Primer	
<400> 9 gatcgtcggc cgcttgggtc atagacttct ttgagaacca g	41
<210> 10 <211> 41 <212> DNA <213> Artificial Sequence	
<220> <223> PCR Primer	
<400> 10 atcagttagc ggccgcacaa gctaagatca caaagctgtt t	41
<210> 11 <211> 37 <212> DNA <213> Artificial Sequence	
<220> <223> PCR Primer	
<400> 11 tatggcgcgc cgctgacacc cagcctgggt gccggtg	37
<210> 12 <211> 39 <212> DNA <213> Artificial Sequence	
<220> <223> PCR Primer	
<400> 12 tcgacgcgta gcgctgtgtg gccttggcag tttccatag	39
<210> 13 <211> 45 <212> DNA <213> Artificial Sequence	
<220> <223> PCR Primer	
<400> 13 tcagtaatgc ggccgcggga tcattcctgg actcagattg ttctg	45
<210> 14 <211> 41 <212> DNA <213> Artificial Sequence	

```
<220>
<223> PCR Primer
<400> 14
                                                                             41
tattaaggcg ccgggcatgg gagtgatctc accaactctg g
<210> 15
<211> 46
<212> DNA
<213> Artificial Sequence
<220>
<223> PCR Primer
<400> 15
tcgacgcgta tttaaatgtg ctggagtgtt gagatactgt agtggt
                                                                             46
<210> 16
<211> 28068
<212> DNA
<213> Artificial Sequence
<220>
<223> Modified adenovirus
<400> 16
                                                                             60
aaacatcatc aataatatac cttattttgg attgaagcca atatgataat gagggggtgg
agtttgtgac gtggcgcggg gcgtgggaac ggggcgggtg acgtagtagt gtggcggaag tgtgatgttg caagtgtggc ggaacacatg taagcgacgg atgtggcaaa agtgacgttt
                                                                            120
                                                                            180
ttggtgtgcg ccggtgtaca caggaagtga caattttcgc gcggttttag gcggatgttg
                                                                            240
                                                                            300
tagtaaattt gggcgtaacc gagtaagatt tggccatttt cgcgggaaaa ctgaataaga
                                                                            360
ggaagtgaaa tctgaataat tttgtgttac tcatagcgcg taatatttgt ctagggccgc
                                                                            420
ggggactttg accepttace tegagactce cccaegetett tttctcaeget etttcceee
ttccgggtca aagttggcgt tttgattcgg ccgcttgggt catagacttc tttgagaacc
                                                                            480
                                                                            540
agttataagc tatggtttct ctccacagaa aaagcactta tggtgtctcc ccctttccag
                                                                            600
cccaccaaca ttttacatct aatttggggg ggttttctgg accacttaat acccatccat
ggatctcatg tgaagactcc cctggcttga gaaatcactg tcttgttgaa aatgggaaca
                                                                            660
                                                                            720
aagctaagtc agatagctgg ttcatcagca atgactttga ccaagcctga tcccacccta
ccccaccca ccccagtgac cacccccac aatggagcac acaactctaa actggtttgt
                                                                            780
                                                                            840
aggtatgtgt gtgtgaacac gctgaggaat ctgcaaaacc aaatggtgag tgcaaaacca
                                                                            900
aacagtcacg agtaaatctc acaacaacca cgtcctgagc tgcagccctt gttgaactat
acccactag ggccccaaga ttttaggact tgtgtgtggg tgggacctcc cctttctatc atgctttaga agacagggat ttcaccagaa ttgaacatat tgaacatatg acccattttt
                                                                            960
                                                                           1020
ttcagccaaa ggcaattaaa ataacttcat acttgatatc catgtcagca aaagctgcaa
                                                                           1080
                                                                           1140
aacgcaaatg ggtggctgct aagagccctg gtaccctgac gagcacacca agtgcttagc
aacagtggtg tccaaaggac cagctggaag cctgccttga tgagaagttg ctcttctttc tacatgaagg aacacctcta ctctcctgct tttaatacct gagctgtgag tgatcatcta
                                                                           1200
                                                                           1260
tgtccattag caaacatccc agtggagaag gaaacactca tacccgaaat ctaagctaca
                                                                           1320
                                                                           1380
tagttggaat cacttcaact tattgcaata aacacttact aagcacctat tgtgggcaag
tctttgcaat ggataatagt tcagtagata ttttgatgta atatttgaaa taacaataaa
                                                                           1440
aattgccacc actgaattta ttgagcattt gctgtgcttt aggcactaac ccaggttctt
                                                                           1500
taaatatttg gtcttattcg atctgtataa atagccatct atgagaaagg gactattatt
                                                                           1560
gcccttattt tacaaatgag gccaatgagg cccagagagg ttaactaagt tgcccaaaat
                                                                           1620
                                                                           1680
catacagccc actagtggca gagcaggatg caaacccagg cttgcctcgt tcccaagccc
acatgtcgtt tgcattggtg tggaggtgtg catgtgttta gtcattagca tgttatatga
                                                                           1740
taagcaagtt ttgaaacata gaaacttaaa atgtgccatt aagaaaagta caggcaaggt
                                                                           1800
tttccaaggg gaggtgtgga cctccggaca aatttttaag aactaattat aaatacttaa
                                                                           1860
                                                                           1920
aaatgggaat aagaagacaa cctaactacc tgaacagttt tagagatgac tcatgcccac
cctctaaaac ccaaacaaaa acaacaaagt caagaaaacc catgaaatct tagcaagcga
                                                                           1980
                                                                           2040
tttctatgta cttgtgaaaa ggatttcttt accattctaa tgggatttat gccaaccata
gagggctcag tgcccctccc atggggtggt tagtgagtac agagctgagc tcaccggcca
                                                                           2100
tctgcagctt catgttatca agctccagtt tgtccttgga gcaaggttat ctgggacatg
                                                                           2160
```

```
2220
agcagaggca ttgctttctg caatggacag ttctttctgc ctgcatacct agctccttga
taactttaaa taccatttta tagccacact ggagttttga agacctcaat atgcaaatat
                                                                         2280
                                                                         2340
tactcaggtt ctgattactt gtctgctcca tgataacaca ctctaaaagc aatgaatggg
gcttatttgt agagaactga agcattttaa gcttttgctc aggaatccct ggtagcttcc
                                                                          2400
                                                                         2460
tgtgacttgc aagatattag tgatgggtca agaaacagga ccccccatca gcataacata
                                                                         2520
cgcagtgcct cagtagtcca tcaggcagaa aaaactgcag atggcacatg gaaatgacca
                                                                         2580
gcggcggaag ataccccgac agtgtgggca gttctatttc agcagcaatc aagagggggc
                                                                         2640
ctggagccac tcaatcaagt ggagcaggat gggagcaagc actgtgcaga ccaatgcaat
ccccagttaa cacaaaaaat aaataaaaga gatgagattc agtctcttga ctgtgactga
                                                                         2700
ctgggagctt tatagctgat gcttgtgtct tttctccatt ttatttaatt aggaaaagaa
                                                                         2760
atgettatea cacactetae gtgtgaggta caacetecae aggaaaggtt gttaggaaca
                                                                         2820
tttcaacttc tagaagtttc taaacataag gtaaatccat ctttgtcctt gggatcactg
                                                                         2880
                                                                         2940
cacatctcag aaaggcaaat aaatcagtaa ttggtgggca taattactag ctcatggact
                                                                          3000
gacaaggtct acactatttc gaatctcaca gaagtaagcc atgggacaga tagagtctga
tagtggtgcc ccgtttcctg gaggtcacac ttactcatcc ccctggaccc tgggcttctc
                                                                         3060
3120
ctccaatggc tcgcaccaag actagagatg caagtgcaag cacatccacc ctctcagcag
                                                                         3180
ccaggttttg cgttccataa tgtcacgtac ccccagtcat accaatctcc ttggagctct ccagacaggc tgccatgtgt ggtcggccct ctgtgcttgt gctccttggt ttgccaagcc
                                                                          3240
                                                                         3300
tggaatgccc tttctccatg attgtactct gggaattctg tgtgtctttc gagatgaagc
                                                                         3360
tectecacee tggaaattet geetetettt ceaggteeag etectgtgge tgaataceet
                                                                          3420
tggctgactg aacattcttg ctgggccaag tcttaatcat ctctaaatcc ctctggtgcc
                                                                          3480
ccgacagtat ctagcccagg caaagggctc agcaaatact tgcaaaattc aataaacttt
                                                                          3540
                                                                         3600
actatgttac tagcttggca tgatgttcta ggcacttggg agattataat ctggtgagca
                                                                          3660
ttgtgctagt ctttttttg ggataaacac caatgataaa ctgagccttt actctcattt
                                                                          3720
tagcacatct actcatctct tttcaatgct ggtgggttta taaaacccat cagtagaaca
gagagtgatc ataatcatat ggtgaaaata acatcagcta acatatttac tgaacatgct
                                                                          3780
ttagtgtgct gggcactgaa ctctgtgcac atgtgaattt gagatagatt gttcctagct
                                                                          3840
aataagatga ggaagtggag atgggcttac tcaagtcaca caatagcaag atggggtaca
                                                                         3900
gacagaaacc aagctagaaa ccaagcaacc cctgggtttg gaaatgcatg ggctcctcct
                                                                          3960
                                                                          4020
ctgcacatgg cgaggagcag tcaggtgctc ctccttctct catactgaaa taactctgca
                                                                          4080
cttttggcta ttctgtgaca ctctgtgcta ttctgtagct caaatggctc tggtgcaagg
agctcagatt atgactaacc cccatagata ttcagctgct ttgcaagaag tggatgaatg
                                                                          4140
                                                                          4200
ctctggcttt ataaattatt gactagattg gatattggcc caatctccac tctggtgatt
                                                                         4260
cggaaggagg catatgcaca tttgcaaggt tatagtagtg cactctaatt ccactggctt
ctgagagctt gtaggtttct tgacttaatc attctggaat taaggtaatg gatcctcaac
                                                                          4320
accttttctt tccctggcct ttactaacca tgtaacagaa atgagcagag aaaacccaag
                                                                          4380
aaagcgaact ggagacttga tgagtgtgtc aaagatgctc agagtccaag gtcctctgtg
                                                                          4440
gctcactgac ttcagaagcc aacctccgtt gttcaagtca cttgtgaggt tactatgcta
                                                                          4500
                                                                          4560
gagcactaaa tattatccag atagcccaaa gaggtgaagg cagacatgtg gaagaacctg
                                                                          4620
gatttttggg caagttgatg aatgcctcct gccccatatc aaagagaggt gataggagac
aactttgtga atttgaaata atgcaccggg gaaacaggaa aacgtaatgt aagtcacgct tcttggcttt tttcttgcca ttaccctact tggccaagtg caaatgggat ttcaatatat
                                                                          4680
                                                                          4740
cataagtatg catctattaa taacaatgca agaaagctgt acaactgaag tctgagattt
                                                                          4800
                                                                          4860
tgtaagaaac agaatctctg taagcatcac catccaacag aacttcctga gttgatgctg
aatcatccca gaaagaaggc gcgccagctc tgcaggatct tcaagtctgg ggtgccacca gcaagcgacg gtcctccatg ggctcttcac cttacggcag tgtccagagg caccgccagt
                                                                          4920
                                                                          4980
cctctgctcc tatgctggtc ctgctgtccc tggcaaaagg agccagagca ttctctccag
                                                                          5040
                                                                          5100
gcctcccgag gaggctgctt cctttgtttt gcagatggag gctcccatcc tttgttctga
atcaatgtgc tccaaagata agccccaaga aaacagttgt tgccttttga cactgacaat
                                                                          5160
tagaatcgtt ggaaaatgga gaaaacagga aatggcaaat ggtttcagtg accaggagga
                                                                          5220
aaccgtgcct gaaagttgct gcttagtgac tgggacactc gctttctgct ctcttatgaa
                                                                          5280
ggacagccta ggccgtgtgg ccttttataa acaaagctat gaaggggtcg tcaaattttc
                                                                          5340
tagggetgea actgtggeae taegteetgt tgtgeeaggt gacaetgaea ageageaetg
                                                                          5400
agttctatgc aagcccaggt gtgcttctct catggtgacc cccagagaac taaggcccag ctcttcctct gtcacacccc tcccagcccc cactgtcaga caagggacca cattcacaga
                                                                          5460
                                                                         5520
cagtctcagc caagatggca accttggaag tcctggggat gcctttctag aagctttagg
                                                                          5580
                                                                          5640
ctgacgccag ggagctgtaa agcccccacc tgtccctggg ggttgtgtgc tgggcaggag
agaggggaaa gagcccaaac tccaccactg cctgctggca caactgagcc cacgccaggc
                                                                          5700
actgcaccag cttcactcac cagctaccac atgctaatgt ctcctgttta cccaggtgca
                                                                          5760
atcacctgag tgctgctttc tcaccactgc atgggaagaa cgatctcatt accaattcaa
                                                                          5820
ccacttaagc aggcaaaagg actccaacgg gggaaaggca gaggacaaac gattcgggga
                                                                          5880
```

```
5940
ctgagacaga tgcccacaaa atgttcctgg attttagccg gattcgggct gaagttcctt
gccctatgag cccttggagg agagcatcct gactcagaca agaattcaaa tgacaagact
                                                                           6000
                                                                           6060
tctgggggat ggcagtgaat ggatccaaag ccttgtttta taaagaatgt ggaggaaggg
                                                                           6120
aggaaggaag ggagggaagg ggagactgag agggagagag aataaagaag aggaagagaa
6180
                                                                           6240
agggaactee totelett teeageagae actoeleat gagtgeeece acagagagee
                                                                           6300
                                                                           6360
agcctgccac acagcagaag gtgctcagct atctgtccca aaggttgagc actagtgtat
accacaagga aaaaaacctt cttttgtact gtttggaagc cagaattaga aacaactcgt tcacccttct gactttccct ttgcaatgac aggaagatag tatactgcat gggaccacca
                                                                           6420
                                                                           6480
cacattcaag atctgagttg tggggacccc cacccccaca tgggtggagc cccctgagac
                                                                           6540
ccgtgggctc tgactggcca tggcccatag atagtgacaa catacacact gctatctgaa
                                                                           6600
                                                                           6660
gcctagttgg aggacggatg gatgctttta ggaaaaaatt ccctttagtc gtccctcaga
                                                                           6720
aactacaacg gcttcctaaa atgaatggca ggcaagtttt gattgtttcc taagttcccc
                                                                           6780
ctaactctca gagcctgtga ctcagcttct ccagaatgcc tgcagggagg caggaccact
                                                                           6840
gggagtaatg agcacgaatt gggccacttc tcccagtgga ctgttaacgc cgagatctgg
                                                                           6900
ggtggaaccc actgaacacc tgcccttttg cgttgcccag aatgcagcca gagggatacg
ggccacagta actetggggc ccetgaacet acetteccaa gaceetgaeg ggaaggtatt
                                                                           6960
gettacatga cagtecagte agtecetetg teacteagtt aacaaacatg gteatgggte tactatggge caggetetgt teegggeatg gggataacae egtgtgtete tactettatg
                                                                           7020
                                                                           7080
gacacaagta aatcaatcaa agcagataat gttctaatga ccacccagta gggtgaaggg
                                                                           7140
                                                                           7200
atggagggtg ggcaggtgct ggcagaaacc taaggtcaag tcatgggacc ccaatgggga
actggaaact gccacaccat tttctatgtt aggggtcttt ccttgccctt ctagagacct
                                                                           7260
cacccatggt aatgatgctg ccctcaggtt tgaactggtc tgaagctgtc actgggggct
                                                                           7320
tcacaaaatg aatgccactg aaagcaaacg gcagagatct gtatatgaaa ttcttttac
                                                                           7380
                                                                           7440
cctttgtttt ctgtcttccc acatgatcta tgactgctgc aaactctatt ctgactcctc
ctcagtcttg gccggtctgg gaagaacttg gtttagatgc tgggaatgat cccgggcaaa ggaaacaaat atatttccag cttgcttttc ttcttcccct gtggtgcctg catcctctgt
                                                                           7500
                                                                           7560
ctcgcactga ctcacaggct ggactgacaa agtggctgtg ttgacaggga ggatttagtg
                                                                           7620
gatgccaggc ctgaccctca aaggccctca ggtggggcca atttccaagg ttcttagaga
                                                                           7680
                                                                           7740
agatttgggg ccacaaatct gctctgccac ttcactgctg ggtgaaagct gttggcttga
                                                                           7800
gaagagagag aataggtgag ggacaataat tctcaaggca agctagctga tatcctttca
                                                                           7860
tttgtggctt ccaaagacag ggaaaggcaa ggcagaccag ggtggaaaca gcgacatcct
gaggggacga cgtccgtttt gctaattctg tttccctggc agctttgtgc tggacaagat
                                                                           7920
ttctctggtt tcagctgaag agtgaacagc tgaggagctc tgtgactctg agagagagag
                                                                           7980
aaatcaatag cccttgaaag gaaagcactg cttgttcttc caggccaggg caggcaggat
                                                                           8040
aaagagaaca aggctgtaca taccaaagcc gaatttccat taaaggccag aatcctggga ggccctttca gcttaatgac catcttctga tcactatcac ttagaaaatg ttcatgtctc
                                                                          8100
                                                                           8160
cagttttctc tgcagatagt gcagacatcc tgtgcacatt gatattttat gcaccagatg
                                                                           8220
                                                                           8280
caattetetg caaaggteee etetggetgg tgtecateeg ettgetetea tgaceaetga
                                                                           8340
tgcgactctg ggggcaagtc aagccattcc ttctagactc tagaatctag aggatgatcc
                                                                          8400
caactcacag gcctcttgga caagcttgct ttggattcct tctgcctgta ctacccagac
tgccagtcct ccagcagggc aatccaactt cctgcctcta gggtgtggga gtcctgggcg
                                                                           8460
gggtttggaa tccacagcag atggctggca ggagaggcag ttcccgagca cccactaggt
                                                                           8520
                                                                           8580
gccaagcagg caggtatcag gtgcagggct tcggaggtgc agaagcacag cccctgtccc
cctcaggttc ccagtctggc ctcagggaca gacaggcagg taggtatgga aacggggtac
                                                                          8640
tggaaggcat acagctgagg gagagagcag ctgcaccctg gtcaatcccc cactcatttc
                                                                           8700
cctggaggtg gggctgaggc acctggagca ctctgcttgc ttgggttgtc cctttgccaa
                                                                           8760
agaatgccgg gcagaaagta gagaacaagc aggcccagga agcactagaa gtccctcatg
                                                                           8820
ggtggacaga gctttacctt cggagctgtc acctcctgtg ttcctcccaa caaccctgtg
                                                                           8880
aggcaggcgg gcaggctgag caggggactg tgccccgttg acagatgagg aaagcgaggc
                                                                           8940
tcagggggaa gtgacttacc tgtggcgtcg cagctaggca gtagtggagc gggcacctgc
                                                                           9000
ctccaggcct tcggatccca gctgccccag ggcgctgcct ctgaggtgct gtacgaggag
                                                                           9060
                                                                           9120
gtgactcggg ccagctcatg agcaaaggag ctgccgggca ggaaggactc actccccagg
gcctggcagg acgggggctg tcgcccgagg ctgacctggg ggtgcctggc ttccccaagc ttgcaggctt tgtctacatg agtctacaac aaccgattga acaatccatc agctgcttgg
                                                                           9180
                                                                           9240
ccacaaaatg gttctgactg atcttgtcac tgccctgagt gtctagctgg gtcatctggg
                                                                           9300
                                                                           9360
tgttgtggtt atacccacca actgctttgg tggaacgaaa ccgcggccgc gggatcattc
ctggactcag attgttctga agaagcccag ttctgggtgg catcaagtgc ttgctagatg
                                                                           9420
gggggcttgc cttgatccgg ctacacttgg aggtgacttg ttcttggacg gctacataca
                                                                           9480
gaaagagaga agtggggatg agttccaaag gcatcctcga cttcggctgt ggccaccgga
                                                                           9540
gggtagetce tggcccaaca eggacttete aceteegge ettggctete taetgagete
                                                                           9600
```

```
9660
cccctgctc cccaattcct cgccattccc ctcatttctc tgccctcagc ctggactgca
gttcttctgg gaagctgccc caactcccta ggtctgtgct caccaagagc agatcacact
                                                                           9720
                                                                           9780
ggactgaaat gccagctgat ttgtctcttc aagaaaattg gaagctcctg gaggtcaggg
                                                                           9840
tccatgtctg cttttacact cagtgctctg tatgcaggcc tggcactgcc caccctttga
                                                                           9900
caggtggtgc atattttgta gaaggaagga aggggccagg tggggtgggc tgggctggtg
                                                                           9960
gcgggagcta gctcagcctc ttagattctc tacccgatgg atgtgacctg ggacagcaag
tgagtgtggt gagtgagtgc agacggtgct ttgttcccct cttgtctcat agcctagatg
                                                                          10020
                                                                          10080
gcctctgagc ccagatctgg ggctcagaca acatttgttc aactgaacgg taatgggttt
cctttctgaa ggctgaaatc tgggagctga cattctggac tccctgagtt ctgaagagcc
                                                                          10140
tggggatgga gagacacgga gcagaagatg gaaggtagag tcccaggtgc ctaagatggg
                                                                          10200
gaatacatct cccctcattg tcatgagagt ccactctagc tgatatctac tgtggccaat
                                                                          10260
atctaccggt acttttttgg ggtggacact gagtcatgca gcagtcttat ggtttaccca
                                                                          10320
aggtcaggta ggggagacag tgcagtcaga gcacaagccc agtgtgtctg acccacccaa
                                                                          10380
gaatccatgc tcgtatctac aaaaatgatt ttttctcttg taatggtgcc taggttcttt
                                                                          10440
tattatcatg gcatgtgtat gtttttcaac taggttacaa tctggcctta taaggttaac
                                                                          10500
ctcctggagg ccaccagcct tcctgaaact tgtctgtgct gtccctgcaa ctggagtgtg
                                                                          10560
                                                                          10620
cctgatgtgg cactccagcc tggacaagtg ggacacagac tccgctgtta tcaggcccaa
agatgtette cataagacca gaagagcaat ggtgtagagg tgtcatggge tacaataaag atgetgacet cetgtetgag ggcaageage etettetgge eeteagacaa atgetgagtg
                                                                          10680
                                                                          10740
ttcccaagac taccctcggc ctggtccaat ctcatcccac tggtgcgtaa gggttgctga
                                                                          10800
                                                                          10860
actcatgact tcttggctag cctgcaacct ccacggagtg ggaactacat caggcatttt
gctaactgct gtatcctagg ccaataaatg ttgatcacat ttatagctgc catggtaggg
                                                                          10920
tggggacccc tgctatctat ctgtggaggc tctgggagcc cctgacacaa actttctgaa
                                                                          10980
gragagecte eccaacecet tttecattee etatacetga cagatggece aggaacecat
                                                                          11040
tagaaatgga aggtcactgc agcagtatgt gaatgtgcgt gtgggagaag ggcaggatca
                                                                          11100
gagccctggg ggtgtggcag cccccaagtg attctaatcc agatcctagg gttgtttccc tgtcccattg aaatagctgc tttaaggggc ctgactcagg gaaatcagtc tcttgaatta agtggtgatt ttggagtcat ttagaccagg ccttcaattg ggatcctgct cttagagttg
                                                                          11160
                                                                          11220
                                                                          11280
gatgaattat ttaactgatt ttcagatctc ctctttctca atgctttcag aagcacagta
                                                                          11340
                                                                          11400
actgcttact ctgaaatgaa ttctcacccc acttccacat atgcacccct tgcccacccc
tttgggaaca ctggccttaa ctgcttacct tcaaatggac tcatctgttg ggagatatat
                                                                          11460
gcattctgcc gttcaggggt cattgccata agacctgatc tctgttcctc ttgctaaaca
                                                                          11520
gaagatgaaa aagacaaatt agattacagc taccaattaa taattagcct taggatcgct
                                                                          11580
gcgtggggac ctaggacttg gctttggtgc agcagaaagc atgaataaac acaccagcat
                                                                          11640
                                                                          11700
acactegeat geatgeecca ceetetegag caaaatteea caggtataaa taaagtaaga
ttctgcacct gggttaaaaa cacaactgca acagcataga atggggcagg agagacagaa
                                                                          11760
cttaatagca agagcacaca gaaaaaagtt ttaggcattt tggatgtcca tctgctcagg
                                                                          11820
atgggtcagc agtgagatgc ggtcaccaaa agaacaaatg taacattagg ctgcattaat
                                                                          11880
agaagcagag tatgtagaag gagggaggtg acagtcctat gctaactctg ccttggccag
                                                                          11940
                                                                          12000
actataccca caggagtctg ggcatgccag tctcagggag acccagacag actggctgca
ttcagaggat ggtaagtaat gagagtgggg attggacttc aaactaccca gacaaagaat
                                                                          12060
ggctgagcaa gccaaggatg ctgtggctgg ggcagagcag actgtgggct atgtagtggt
                                                                          12120
ggatacctag cctctgcagg gctgtcatag ggaaaggaca ttgagaagag gactgaggct
                                                                          12180
                                                                          12240
tgttcctggt ggtcctggca tgaacggcca gatgatcaca tggtcaggtg gacacagtct
ccaacactgg gagtagccaa acacttactg ccaacctccc gcccttctcc tgactagttg
                                                                          12300
                                                                          12360
cagcataggc aattgggagg agcttcctgt ctccatctga aagctggctg ggtgggcagg
gggaggageg agccaagttt caaggeegea gttteageae teagtetggg ateggeteaa
                                                                          12420
ggagcaaagg ggaagaacat agccaggagg gaataacatg aaggccccca gacccagaaa aggcatgact tgctctgaga ccctcagccg gttggtgtca ggttgtgact cggatccagg
                                                                          12480
                                                                          12540
totgactocc agtocagtgo ttgaagcotc accocacaca gtgaggggag cooggocatc
                                                                          12600
totgotcaac tgctgccatc totctcccct totcaaccac caaggcaget ctgtctggga
                                                                          12660
gcacaagete caagtecact ttetggtetg tgteceeece aagatgeeag aggaettgee
                                                                          12720
                                                                          12780
tctacaacac gggctgcccg tgcagtgcct gcttttccag caaagggctt ctgggaaccc
ttctctgcac tcagtggggc tggtgggagt ggggcggggt agcgacccag tgcttgggac
                                                                          12840
tgtgcccagc tctcaggcct ggcagcagtt cctggccttg gttcctgcca aggcagagag gacaaacaca tggcaccggg aagactacac cagaagcgat tccaccagac tggggtttgc
                                                                          12900
                                                                          12960
ttttctatcc cgcccttagc ctgcttcctg tcctggtccc tgcctccccc tccactggag
                                                                          13020
                                                                          13080
etgeegtgtg ggeagtgagg ggetgtttet cagetgeect atggagetge eeteteeetg
                                                                          13140
ccaaagcatt ggcaaggcgg caaggggtgg gggtggggat ggggggtggg atctgccttc
tcaagctctc attatactga gcacgtctca cccattattt tatgtcatct agcaacaccc
                                                                          13200
                                                                          13260
catgtggaca ctgaggagca tgggggtcac atgaccactg cccaaggcca caccatccgg
                                                                          13320
atctgcctga gatggtcagg gttggcagcc atttctgaag gcagtccttt cgctttggct
```

```
13380
cttcttgtac cagtctcagg acatcagggc agaagatcta cagtccccag cttactgatg
tgacagcaga ggctcagaga ggttaaatga cttgcccaag gtgacacggc taagaagtac
                                                                            13440
                                                                            13500
agtateteet aactgeagae caggtgette tgetgettet ggggacagat teetgegtgg
                                                                            13560
ctggctaggt ctaaacggtc cttaactcca tccccaccgg ttgctgcatt agtttcatca
aataacacag ttgtacagag gtaggggttc aggggcaggg gcagatggag gctggagagt
                                                                            13620
gtgactaagg aaacagcagg ggaagtgcgg taaagtccga agggagggac ggaaagagaa
                                                                            13680
agccaagccc aggggcgtgc cagacaaaag gaaaggccac gccggggcag ggcaggcttc
                                                                            13740
agegggtget ggggegtett cateceggga ageacacatt eeagaggace eeggagteta
                                                                            13800
                                                                            13860
atggaaaagc tggccagcct atcactatgg aaactgccaa ggccacacag cgctacgcgt
atttaaatgt gctggagtgt tgagatactg tagtggtggg atgcttaagt gctggggtgc tgggtgttgg gatgcctagg tgctggggtg ccgagatgct ggagtactag tgtgctggga
                                                                            13920
                                                                            13980
tgctgaagtg ctggggtcct gagatgctgc agtgctaggg tgctgagatt ctgggctgct
                                                                            14040
ggagtgttgg ggtgctggga tgctggagtg ctgagatgct tggacaatgg ggtgctggaa
                                                                            14100
                                                                            14160
tactatggtg ctggggtgct ggggtattga gatgctaggg tactgggatg ctgaagtgct
gagateetgg agtgetggge tgetgggeea caggetettg aatecatteg tetgeecagg
                                                                            14220
ggaagaaacc agaagataaa gagctaatga aggagctttg gttgagaggg aggaagtaat
                                                                            14280
ggaaggagca acatcttgtg gaggagcagg agagaatgga cctcaggttg ggagagaggg
                                                                            14340
                                                                            14400
ccaggctaca ggccagagag gcagaaggat tccagcagag tgtgggctcc aggagccaag
gggaaacagg tttctgggag gagagagtcc agtactgctg aagtggcaag tccgctgagg accaggaagc ttcatttggc tttatgacca ggaggaattt ggaactgtga ctagagtact
                                                                            14460
                                                                            14520
tagggggaag gaggcaagac tggagccaga ttgctctggg ttgaggggtg agtggggaggt
                                                                            14580
                                                                            14640
gaagcagggc actgtcactc ctttgaaggg tggcagagag ctggaattgg tgctggatgg
gctgtggggt gacagggtca tgtggaaagc ccctgggggg cacctggaaa aggagaagct
                                                                            14700
gacagtacag tgagaggaca gctaagggaa agcggaatgg cagaacacgc actgccagga ggaatgagga tagggtcagg agtgccaggg gcagtgaggc cagcctgggg tcaggtggca
                                                                            14760
                                                                            14820
ggacgtgtcc aggaagctgg tctgcactgc agcccacact ggctcagcct tgaggttccc
                                                                            14880
                                                                            14940
tgtgtggttg gggtaggaag ttgaaccctc tgggaatgga agatggaacc agctctgcga
gccaagctca gcttttatct atgggtctct gagggctggc agagctgagt ggggacaact gtgatccgtg aggctctcag gttgaggtgg ccctccggg agggcttcat tttcccagcg
                                                                            15000
                                                                            15060
ggtaggttct aagcagcagt ggctgggcag gtgggtccaa cacagagcca gagaagggtg
                                                                            15120
aatgggcctc ctggcacccc acccctgctg cccctgagct cagtgatgga gggggacagc
                                                                            15180
                                                                            15240
acagctgagc ccaagtgctt tggtgtggcc ctgagggaaa gctgcagcct gcctggggcc
tggcatggat gggacacttg aggcagaggg acaatagtgg gcgctgcagt gaggctggct
                                                                            15300
                                                                            15360
cttggagagg tttcctgagg agtgctgcct gagacgggca gggagaacag agacaaagtt
ggtgacaggg aatgaaagct gactgaagga ctttacccag acctatgagg atatctctct
                                                                            15420
                                                                            15480
cagcaggaag caggaggga ctgtgtgagg actggccaag agctggagtg ttgggaaaat
gactetttet eegaceeete tgteetaget etggeeeetg gaetgeggag gtetgettee
                                                                            15540
acceceattg gtegategtt gteeettgte acagecattg agaattttgg cagggageat
                                                                            15600
gttcttagag catttttagg ctctgcggga cataacagct ctgcctcaga gcacatgcct
                                                                            15660
ttctcagctc ctgaaagcca ctgatcaaat tggaacattt tgtaccttag ggatgaggat
                                                                            15720
                                                                            15780
atcaactctc ccagccactt agagggataa atgtgatgat gcattcaatt gtgactacat
ctgatcccaa ctgttgcttc agctgctctc ctatagcaca tggcgggagg cgtgcatccc
                                                                            15840
                                                                            15900
agtagctacc tececacttt tggggagatg tggttecate catgaaacct gggtaccege
                                                                            15960
ctaccaggtc ctggcctatc aggtggcagg gtctggtcaa agaagggcat gtgtggtctt
                                                                            16020
cagcaaggga gacaggacgg tggtgcagag cgtctagacc ctcagggcaa gtctcccca
cacctgctcc cggggcagtt gtctttgtga cctcccatcc ccctctgttt catcctctat
                                                                            16080
aaaatgaggg gctgagcccc aaaataacag gcttctttgc catgatgcaa aactgctgaa tctttctttc tgacacacaa ggcatcgagc agcctctgaa agaaccaaag ccactagcag
                                                                            16140
                                                                            16200
gcttcctgac ttgggtttgt aggtactgaa tactcccttg aaaaataaaa acatagaggc
                                                                            16260
                                                                            16320
acttttctcc tggctgttta ttacagaacg aagaaaaaac acactggctt gaaacagacg
                                                                            16380
ccagatttca aatgtagagg tgaaatacga ggtggcaatt aaaatgtgat tacagaaagt
ctggacactg agaaaagttt acaggacagt gggtgtgggt tttctataac agacacttaa
                                                                            16440
atatacatga cgataattgc agatagaaac catcaaagac aaaccccaaa tcaactaata
                                                                            16500
atgtttacag atgttccccc ccaaaccaca gagccttaca tcaaaacaaa tactgaaagg
                                                                            16560
                                                                            16620
ctttaaacca ggaacagctc gccttaaccc cacgagggtg cacacaagct gggctttttc
tctcggtctg aatggtaaag ggaggaggat actctagctc ctccaggtgg attgctgaga cagggctcgg ctcacacact gtctctgcgc ctctcccaaa tctggagaac tctcccagcc
                                                                            16680
                                                                            16740
tcctggtaaa gtgtctctgt ggggcactta acgataaaac agcttctgct gtaaagctca
                                                                            16800
                                                                            16860
ttaggaaaga gctagcggag actgaaaggt tcgcaaaaga gattaagaat cacacaaggc
                                                                            16920
aataggattt ttagtgaaca tagaaataaa tggccaagtg gttttctatt tggcatttgt
                                                                            16980
caacttgcac aacaactctt ggtcatatcc acattgctca ttgcattaaa accataagcg
actcagccac ctagcttaac aaggtatcac tggagcaaac aacacggtct gcatatttgt
                                                                            17040
```

```
17100
aacattgtat aataaacaca aaacaatgca tagtaaacac aactctactg aaacaaaagc
cgtcgcttta tttacaaagt cacaaaatga agtataaata cttctgtcat taatgtttag
                                                                          17160
                                                                          17220
gaaaaccatt tacaaaattt tcaaatatgt acacgtagct tgaaaaatca ccagctttcc
attttgtcac aggtagagag agggataagc atgggctgac aacaccactc aaattgtaac
                                                                          17280
gggagacaac tgcgggtatg gatcgacacc acttcctaga gtgatgtcac catgggggtt
                                                                          17340
tctatgggca tcctgctcag atttaaagtg ccccagcatc ctgggtgact tgcccagaat
                                                                          17400
                                                                          17460
tctqqqctqt ggcattttga gcagcagcat gctgttccaa aatgtcgtcg atcagcctca
                                                                          17520
agttgcacac ccagtcttca tctgggctca cacaggagcc tttcaagaga gcttcaatga
aatctacctc attgcagtca ggtgacgaaa tcagatcatt tagtgggggt tggggctggc
                                                                          17580
gcaaaaagtc ggcaggtggc agctcagggg gaatatccgt tctgtcgaac ggacctggga actggctggc agcaacggca gaagcagcag cagcggtggc agcagcagcc acatagcttg
                                                                          17640
                                                                          17700
gtggctcgat gccctgtatg gggctcaggg gactaaagct ggccataccc tgctggagga
                                                                          17760
                                                                          17820
acttggtggt gtttgctaca ggcaccgggc cctgtaccgg gctctgcctg aggctctggc
tgcccagcag gctgaagctg gggttgttgg ccaggggcac ttgtgttccc atcgcagcgg
                                                                          17880
                                                                          17940
gcacttgtgc ctcccaatca gatggcctct gaaggcaggc ctggccagaa ggtgagtgct
                                                                          18000
gctgaacgct attatccact tggctgaggg gtgttttccc cgaaactgct gtggtcacag
                                                                          18060
ctgctgccgc tgtgacccat gcagcattgt tgaacgcagt gggcattctt ggcacactag
gccgtctgag ctggtgggga ctcaaggact gggtgcccag ggagctggga cagaacccag gcaggggcac ttctggtggg gtggccttgg ggctctgcat atgctggcag acagagtcaa gtctgccag gggagtctgg cctgagtgtg agaggatggg acactggggg ctggaggtga
                                                                          18120
                                                                          18180
                                                                          18240
aaattccttg ccgcttcccc agagttggtg agatcactcc catgcccggc gcgcgcgtcg
                                                                          18300
acacgacagg gacatactgg gaatgcgccc ttgccgtgga ggcggggacc cggcagcgct
                                                                          18360
acgtatccag catcaacctg tatccagcat caacccgcca agttcactaa cttggtaggg
                                                                          18420
                                                                          18480
gtgaggttag ggatccttag gagcccaggc agccagactt tctggggagc ccattcccat
ttgtgttgcc aaagtacccc cagcaggttg tgggaatgtt gcctgtgaag agagtctgtt
                                                                          18540
                                                                          18600
ggggtgagat cttgtgtgtg tgcacagggt gacagttgtg tcccatttcc cgggaagctg
tgatggcagc agaacctaga ggagcctgag agagtgtggg agagtgggcc tctggaagag
                                                                          18660
tagaggetge ggagecaggt geagggetgt etgteaceca aaggaagagg gaetgatgae teactgageg tgtgtgtee etggtggeag eaggeeceat agtgaacata ceatacettt
                                                                          18720
                                                                          18780
tctgtcctga gcgatgctcc cagcagtcct gggagatgga acggtcctta ttcggctcac
                                                                          18840
                                                                          18900
aggaaggacc gccttaactg gacagacaca gcaaggtgct aaagatgcct tccatcagag
                                                                          18960
gccaggttgg aagctctaaa gagacttctc ttgctgttct ctcacccacc cccaggttgt
gtgtgtcccg ctgtggattc tcatgtcctt tctgtgcctg gtggtcctct actacattgt
                                                                          19020
                                                                          19080
gtggtccgtc ttgttcttgc gctctatgga tgtgattgcg gacagcgcag gacacacata
                                                                          19140
accatggccc tgagctggat gaccatcgtc gtgccccttc ttacatttga ggtaagcgtt
ccacgggaag cctcttcagc ccctgaagct tgcgcttccc ctgacaggat tctgcacccc
                                                                          19200
tagaaaggca gcctctgtcc ctcgagctca cagtgagccc actccaggag aggggagaga acacagccat ctccgagagg gagcttcggt gaaaggagag catccttcct ttctcttggg
                                                                          19260
                                                                          19320
ggcagcacgt ggggctggca gggagaagag tgcacctttt tagccatggt gcctctgtat
                                                                          19380
                                                                          19440
ggctccagtt tccactctgg ggaaagcaga gtgggatgtc agatttgtgt attggagtca
                                                                          19500
cgtggagaat tctagaatgg gagctgttga ctccttagaa caaacacccg gaggagtttg
                                                                          19560
ccataaaact gctggcactg ggaacttttc aagtggatag gctattgccg agctctgaag
agggacataa aagctcattt cgagctttcc ccagggatag gtggtttcct gcctttttct
                                                                          19620
ggcggtgctg atgttccctc ttgtgggagc tcacgcgggg gtggggtggt ggggaggaac
                                                                          19680
tgcctaatga agtctggctt ccgcctctgc ccattttcgg tgctggcatc aaccgggact
                                                                          19740
atgtetettt etttagatte tgetggttea caaactggat ggeeacaacg cetteteetg
                                                                          19800
catecegate tttgteece tttggetete gttgateacg etgatggeaa ceacatttgg
                                                                          19860
acagaaggga ggaaaccact gtatgtactc agcatttcag aagtccttgg tgtgtgtctg
                                                                          19920
                                                                          19980
gggggggacc agggggtggg gggtggcgga tagaagtcta ggaagggatg agtccccgag
ggccccaatt tagaagcttg tgtgggaaag tgagggctga ggaaattctg ggaccttcta
                                                                           20040
agggaagggc atgccgtaac tctggtgttc tgctggcctg caccgggact tttctcgcag
                                                                          20100
tgcacgctgc catttgaggt agaaccagac acggcaggca acctctcaga gatcccgttc
                                                                          20160
cctcctctgc aaaatgggga tcaagacaga ttcttcccag gcccgggagg gtttgatgga
                                                                          20220
anatocacat eteceacea aacetgggat teateetagg teeetgttgg eegetetgee
                                                                          20280
tececeatat cettgetgee ateaceegag tettgeetgt ettgeettge taacaeteta
                                                                          20340
ttcccctcca cctgcttgct gaggcagaca cttccaaaac gatctctgca gagggtgcct
                                                                          20400
tcctggcaag gctgtgggct ccatggcacg gaagcccaga gcattgccct tcggaaagcc
                                                                          20460
                                                                          20520
agtgggtttg ggggcagggc ctcactgcag cccagcagcc cgggctgtgc ttgctgtttg
                                                                           20580
tgcctctgcc ccctaccccg cacccgggag cagggagggc ttgcaccgag ctgacactcc
                                                                          20640
agtagcctac agagaggagt agtgggactg ggaaagtggc tttaaggtgg ctccatgagt
                                                                           20700
teaggeece teetggeeaa ecegtgeatg actacegeee teaeggatte eagagggtga
                                                                           20760
cagaaatett gttettgggt ggeactgtea tecatgagtt tateetgget ggagaagatt
```

```
20820
ageggaagae acegtagtet gegeaceaea gatattttga gaeteaetgg ageagtagtt
ctcaaatttg ggcatccagc agaatcccaa aagggccagg aaaaggggac cgctggagcc
                                                                         20880
                                                                         20940
caccctagcc cgactcagtt tctggaggtc tgggctgggg cccgagaatg gcatccctaa
                                                                         21000
ctaggeeceg tggaegetgt eeetgeeggt eegggaacee caeteeaage accaeagage
tagcatttgc acttettece cattttgggt acteaageee tgtteagget ttgtgactea
                                                                         21060
ggagtctgga taaagtatgt tatgacattg taggagtgaa acttcttgtt acggaaagaa
                                                                         21120
                                                                         21180
agttaacagg aaggtcagtt gagcctcgtg tgtgaaataa aaaattctta tttttcaggg
                                                                         21240
tggtttggta tccgcaaaga tttctgtcag tttctgcttg aaatcttccc atttctacga
gaatatggaa acatttccta tgatctccat cacgaagata atgaagaaac cgaagagacc
                                                                         21300
ccagttccgg agccccctaa aatcgcaccc atgtttcgaa agaaggccag ggtggtcatt
                                                                         21360
acccagagec etgggaagta tgtgeteeca eeteecaaat taaatatega aatgecagat
                                                                         21420
                                                                         21480
tagatgccac ttccggggac agagcttaag tggactggga cgcactctct ccgccttcct
                                                                         21540
ctgcccctc gttcaccccg cagaccagaa ccagtactgg agctgggtct ccaggtacgt
ccatctcatg ccttgtttgc atccagcgcc tatcagccac tcaccacgac gggacgcgga
                                                                         21600
agtggcaggt gacgggggtg tgtgccagca gatgcggatg ccaggaagag tgtgagaaca ggggtgggat taccgtctgt ctgggagggg ctccaggtac ccctcttccc cgtcagaccc
                                                                         21660
                                                                         21720
actgggagat ggctgcttgc caggccccca gaaggaacat ctgtctatac ggtgctgaaa
                                                                         21780
                                                                         21840
teccaateaa aagtattgtt tagaaatgta ttteteeaca gggetgaeet eetgeagete
gctgagcact cccaggtcct cagcactccc aggtcgtggc tggggcagtc agtaggaact gtaactatgt ctctgatgca ccacgtgttt agacacagca cagtcctttt ttctgttcct
                                                                         21900
                                                                         21960
actgtggaag tagtttctct ttgggcatgc tgacagcagt ttttcatagc ctcacggatg
                                                                         22020
                                                                         22080
agccctttct acgggagtga ctccatgctt gtatacagag tatttataca aatgttttag
catcttcata tgcggtgtta acccctagtt ctgtacagca tattctgttc aagtattttt
                                                                         22140
                                                                         22200
ttacaagett gtgetgtagg cacatgeett etgetgeaga agtggaegee egtggeacae
tccccccc ccccgtggg gtgccacgcc ttcatgggac attgccactt ctgccctgga
                                                                         22260
actegtgeag gtacgtagta getgetactg ceacaaegge aacaceaage aagagatggt
                                                                         22320
                                                                         22380
ccatgctttt ctgacgttct cagaatagtg gctagcttca aacctgacaa gcgctgcttg
aagccggaac actagagaat gttgctgaga gcagaaacgg ccacgcgggt cacgactatg cgtgggaaag tctcaagctt ccctcctgcc agcaacaaga aggctttgga gtaggcatga
                                                                         22440
                                                                         22500
                                                                         22560
tgttttcacg tgtgcgtgcc gtttctccaa gcactgcagg ttccaccgtg tgtcagaggc
tgcaagttta acatcctcct gcctgaaaac aaataggtcc tttgctgaaa agagggtaaa
                                                                         22620
aaaagagctt tgatcttctc agccaggaga agagggtggt gttttcacgc gggcaactgc
                                                                         22680
tegeeggeet acatggggtt aatteaagte tgetgegage acgaeteege eettggeact
                                                                         22740
ggcctccagc aagccctgtt ctctttgggg tacaggggaa cgggatggtt tagactttcc
                                                                         22800
tgctcagtgt gtaaaaatg tagctaaagc cactatttt gctctctta agctgttcaa
                                                                         22860
                                                                         22920
taaaccggtt cctcatttta cacgtgcatg atgtgtatct tctttgctgg atgggccagg
aaactggagt ggtcctctca gccagcctca gaggaaagaa atctctagct ggcacaggca
                                                                         22980
gccagtgagt gaggctggcg gctgcagggg cacagccttt agaatgagtc cttcagtgca
                                                                         23040
caggiccag ggtatacggg gtagtgggag gaaggagggg acgcctcgca gatgccactg
                                                                         23100
ttggctgggc tacaccttgc cacacttgtt actgcttagg aggctttctg gagtgttcct
                                                                         23160
tgggtgctac gacaatctgc agcagacact gtcctttcac cgctcctggt cctcgtttgc
                                                                         23220
tccccagtga tgtcaacagc tgaggactgc tcacgctgca acaaaaggct ctgcagtcgc
                                                                         23280
tgtctagctt gccctagtcg tctctagagt tctgcctgaa ctgaaactca agtggggttc
                                                                         23340
ageteatgae ttgtggeaat tgaccaggaa atteaccagt tgetgtgget ggaaggattt
                                                                         23400
teagteetgt gggttgtaac cagaggeeac aggtggatte tgeettagge teatgagatt
                                                                         23460
                                                                         23520
tccgacttgc tgttgaagaa aatgccttgt gaagtgacaa cagtagctct gacccaactg
coggtgcctc gctagttcct atacgtccca ctggatcctc acagccccgg gaagcaggtg
                                                                         23580
ctactactct tatccccggg aggagacaga ggccgagaga ggttaagtga cgtgcccaag
                                                                         23640
tcacacaget eggeagegge egggttgage atcageagte tgtttgeaga ecceteactg
                                                                         23700
                                                                         23760
tcacccctg agccagtgcg ccttgggccc tgcggtcagg atgtctcaag cgtggaggca
                                                                         23820
tcaccggttc gtggcagtct ctggaaggtc actgagctct gtgcccagaa tcgagtcggg
                                                                         23880
ggagtctgtg cagaggtggc cctgtgtgtg gggacagtgt gtgacacaga cactgctttg
gatggacace tetecegiga cetectagea tecaateeca aaggaacaac tgttgcagag
                                                                         23940
                                                                         24000
atggaccgct ggacacaaac ccacgtgcgt ttctctggag acactggcca aggaaaacaa
                                                                         24060
aacatgctcg aaggccaaca gctgcatgcc ccaccgcgat gtgaccgcag acacccgggg
tgtagaaggg tctctgcctg gtggggggac acgtgcaggc cgaggagagg caggaaggag gctgcctccg actcccact ggactgcatg gcgacggcgt gtggtggggc agtcagctaa
                                                                         24120
                                                                         24180
gccatttgcc taaggggctg tcgggcatct gcgtgctggg gaccgacagt gtgggtgtgt
                                                                         24240
                                                                         24300
taggaggatc tgtatggagc acattgctgc ctctggctag gacagggtgg aaagggtggc
                                                                         24360
gtggctacag cctgacccat gggcaccgtc ctaccctttg ttctgtgctt ccgagtgtca
gtcatgtgct ggggtctgtg ggcccatgac tcagacggtg agctctgacc ttcctgagcc
                                                                         24420
                                                                         24480
agggetttge tgtagttgtg cetggeteag gagetetagg acaaggggae egeteeaggt
```

```
24540
ctgcatctac ggtgtggcag ggcccctcgg cactcttgtg cactagtgtc atctttccca
ttgaaatgac tgtgaggacc agaatgtgca catgcagatg ggcagctact tgtctgcctt
                                                                            24600
                                                                            24660
ggccctttat tacacaactt gctgggggtg gagatgccac cccccggcag tcagagcccc
tttatgatgt catggggctg gttacatgac tgccaagggg tgctgctggc cacactgcac
                                                                            24720
tagcaagttt gccagatgga ggacaagcga tcattgagta tggctcgctg tgaagaaaga
                                                                            24780
aattcgagag gacaggatca tggcttggaa agggtgcctt tccctccca gttgcagtca
                                                                            24840
gagacctacc ttcacccagc agatccttcc cctgcctggg acgacccggg gtccactggg
                                                                            24900
                                                                            24960
agccctaact tgaggctgct gacagaagaa atcgctttcc aacctctggc cgaggaagct
tcgttcagaa ggccgcaccc tgacggtgac gtcccgcccc agggagaaga taatctcctc
                                                                            25020
teceteceet ttecacagaa actgtggaga etggteagea geaaceagtt ttegtecate
                                                                            25080
tggtgggatg acagtggggc ttgtagagtg atcaatcaaa aactctttga aaaggagatt
                                                                            25140
ctcaaaaggg acgtcgcaca caaagtgttt gccacaactt cgataaagag cttcttccgc
                                                                            25200
                                                                            25260
cagctaaact tgtatggctt ccgaaaacgg cgtcaatgca ctttcaggac cttcacccgc
attttctccg caaaaaggct ggtctccatc ttgaataagg taatgaacga caagcctctg gaggggttaa gtcggtgggc tctggggcct ggtcgggtgg aagtcccagg actgcctcct
                                                                            25320
                                                                            25380
gggaagtggg cgacctcagg cagggtgtgg ggccatcgct gtgggcctgt gtccccctct
                                                                            25440
                                                                            25500
gggtggaggt gacatgaact aagagtgaat gtggggagag ggctgaggat ggtgcgggcc
cctctcgagt gtgtaaaata tcacaggtgc caagtagccg tatctgcgtg tcgtcctccc
                                                                            25560
cggggccagc catgtcatct ggtggttgct gtgtccccct gactccacag cacattaccc
                                                                            25620
tgtgaggtga gcaggccagg ggagtctggt atttgtacca ctgtcaccct agctggtgtc
                                                                            25680
tggagaggtg ctcaagtgga agcactgaag ggcgcctggc gcaggaggtg cagatgctcc
                                                                            25740
tgctgccctt ggtaggtggg cccctggtgt ggaagagcca gtacccaggg cctccaaccc
                                                                            25800
agccggggtg cattctgttg ccagctgaca ctgcatgggg gaggcccaga atcttcttcc ctcctggtct gcaacttcaa agaccctttc cgccggccat ggacacccta atctgccatt
                                                                            25860
                                                                            25920
ttgaggettt ttccaagacg gaaaggeeeg ceacaacttg gtaaacettg acgatgtgaa
                                                                            25980
                                                                            26040
cgcgagtccc cagcttcctt tggggactgg gaccttttcc agaaaggcct cctgggccag
tagagttctc ttgcacaggg gcgtagatgg ttggtagttg tagtccatcc ttgtgacttg cagtttcctt ttgtttattt aaactttgac ttatagttag agttctactg ccatccttac
                                                                            26100
                                                                            26160
tttcaaagag actcccctca cctcctcgtg aggatgaaga gaagagtggg tgtcaagtct
                                                                            26220
gcaccaagac atcaggagga ggacaagcca gaagctgctg gatcctgtct ggcaccagca
                                                                            26280
gacactgage aacaagatca cacgteteeg aatgagaatg accaggteac accgeaacae
                                                                            26340
cgggaaccgg ccggtcccaa cacccaaatc aggagtggct ctgctccacc agcaactcct
                                                                            26400
gtgatggtgc ctgattccgc cgtggcgagt gacaacagtc cagtgaccca gccggccggc
                                                                            26460
gagtggtcag agggcagcca ggctcacgtc actccggtgg ccgctgtccc tgggcctgca
                                                                            26520
                                                                            26580
gcgctgccct tcctctatgt ccctggatct cccactcaga tgaattctta cgggcctgtg
gtggcccttc ccacagcgtc ccgtagtacc cttgccatgg acaccacagg acttcctgca
                                                                            26640
cctggcatgc tgcccttttg ccatctctgg gtaccggtga ccctagtggc tgctggggct gcacagcctg ctgcctccat ggtcatgttc ccccatctcc cagctctgca ccaccattgc
                                                                            26700
                                                                            26760
ccccacagcc accgcacgtc acagtacatg ccagctagcg atgggcccca ggcgtaccca
                                                                            26820
gactacgcag accagagcac atagagggca gcatttgggc agaatatgtg ctggtcaata
                                                                            26880
aatgtgtcag aaaatgagta attttctgac tgcacaaaaa agtcttcatg gtctccatcc
                                                                            26940
tttitctttc tttgcagtcc agtacccccc tccgacatct ttggcttgca tgatagagac
                                                                            27000
ttcagcctaa cacgcctccc tggaaaagtg cccaggagat actcgagcag gtgctgggtt
                                                                            27060
ttaggaagcc cctcagacat cccgcctcta ctcattaaaa attacctgga gctggccggg
                                                                            27120
cgcagtggct catgcctgta atcccagcac tttgggaggc cgaggcgggt ggatcacgag
                                                                            27180
ctcgggagat cgagactgtc ctggctaaca cggtgaaacc ccgtctgtac taaaaataca
                                                                            27240
aaaaattagc cgggcgtggt ggcgggcacc tgtagtccca gctactcggg aggctgaggc
                                                                            27300
aggagaatgg catgaacccg ggaggcggac gtgcagcaag ccgagatcgc gccactgcac
                                                                            27360
                                                                            27420
tccagcctgg gcgacagagc aggactccgt ctaaaaaaaa aaaaaaaaa aaaaaattac
ctggagttgc tcgctgagtg ctaattgtgc tgctagcatt gccggcctag ggttcacaat gactctgtgt tactggccat tccttgtcat ggcggtgcct ttatataaca ggatcttcac
                                                                            27480
                                                                            27540
tttacataca gatgagatca cgtctggctt tgtcattggg ttaaaaagtg cccttgatag
                                                                            27600
ttgtggaggt gacacatact accgtcgact cgaatagatc tgctaggcgc caagcttgtc
                                                                            27660
                                                                            27720
agcettacea gtaaaaaaga aaacetatta aaaaaacace actegacaeg geaceagete
aatcagtcac agtgtaaaaa agggccaagt gcagagcgag tatatatagg actaaaaaat gacgtaacgg ttaaagtcca caaaaaacac ccagaaaacc gcacgcgaac ctacgcccag
                                                                            27780
                                                                            27840
aaacgaaagc caaaaaaccc acaacttcct caaatcgtca cttccgtttt cccacgttac
                                                                            27900
                                                                            27960
gtaacttccc attttaagaa aactacaatt cccaacacat acaagttact ccgccctaaa
                                                                            28020
acctacgtca cccgccccgt tcccacgccc cgcgccacgt cacaaactcc accccctcat
                                                                            28068
tatcatattg gcttcaatcc aaaataaggt atattattga tgatgttt
```

```
<210> 17
<211> 30115
<212> DNA
<213> Artificial Sequence
<220>
<223> Modified adenovirus
<400> 17
                                                                         60
aaacatcatc aataatatac cttattttgg attgaagcca atatgataat gagggggtgg
agtttgtgac gtggcgcggg gcgtgggaac ggggcgggtg acgtagtagt gtggcggaag
                                                                        120
                                                                        180
tgtgatgttg caagtgtggc ggaacacatg taagcgacgg atgtggcaaa agtgacgttt
                                                                        240
ttggtgtgcg ccggtgtaca caggaagtga caattttcgc gcggttttag gcggatgttg
                                                                        300
tagtaaattt gggcgtaacc gagtaagatt tggccatttt cgcgggaaaa ctgaataaga
ggaagtgaaa tctgaataat tttgtgttac tcatagcgcg taatatttgt ctagggccgc
                                                                        360
                                                                        420
ggggactttg accgtttacg tggagactcg cccaggtgtt tttctcaggt gttttccgcg
ttccgggtca aagttggcgt tttgattcgg ccgcttgggt catagacttc tttgagaacc
                                                                        480
agttataagc tatggtttct ctccacagaa aaagcactta tggtgtctcc ccctttccag
                                                                        540
cccaccaaca ttttacatct aatttggggg ggttttctgg accacttaat acccatccat
                                                                        600
ggatctcatg tgaagactcc cctggcttga gaaatcactg tcttgttgaa aatgggaaca
                                                                        660
                                                                        720
aagctaagtc agatagctgg ttcatcagca atgactttga ccaagcctga tcccacccta
ccccaccca ccccagtgac cacccccac aatggagcac acaactctaa actggtttgt
                                                                        780
aggtatgtgt gtgtgaacac gctgaggaat ctgcaaaacc aaatggtgag tgcaaaacca
                                                                        840
aacagtcacg agtaaatctc acaacaacca cgtcctgagc tgcagccctt gttgaactat
                                                                        900
                                                                        960
accccactag ggccccaaga ttttaggact tgtgtgtggg tgggacctcc cctttctatc
                                                                       1020
atgctttaga agacagggat ttcaccagaa ttgaacatat tgaacatatg acccattttt
ttcagccaaa ggcaattaaa ataacttcat acttgatatc catgtcagca aaagctgcaa
                                                                       1080
aacgcaaatg ggtggctgct aagagccctg gtaccctgac gagcacacca agtgcttagc
                                                                       1140
aacagtggtg tccaaaggac cagctggaag cctgccttga tgagaagttg ctcttctttc
                                                                       1200
                                                                       1260
tacatgaagg aacacctcta ctctcctgct tttaatacct gagctgtgag tgatcatcta
                                                                       1320
tgtccattag caaacatccc agtggagaag gaaacactca tacccgaaat ctaagctaca
tagttggaat cacttcaact tattgcaata aacacttact aagcacctat tgtgggcaag
                                                                       1380
tctttgcaat ggataatagt tcagtagata ttttgatgta atatttgaaa taacaataaa
                                                                       1440
aattgccacc actgaattta ttgagcattt gctgtgcttt aggcactaac ccaggttctt
                                                                       1500
taaatatttg gtcttattcg atctgtataa atagccatct atgagaaagg gactattatt gcccttattt tacaaatgag gccaatgagg cccagagagg ttaactaagt tgcccaaaat catacagccc actagtggca gagcaggatg caaacccagg cttgcctcgt tcccaagccc
                                                                       1560
                                                                       1620
                                                                       1680
                                                                       1740
acatgtcgtt tgcattggtg tggaggtgtg catgtgttta gtcattagca tgttatatga
                                                                       1800
taagcaagtt ttgaaacata gaaacttaaa atgtgccatt aagaaaagta caggcaaggt
tttccaaggg gaggtgtgga cctccggaca aatttttaag aactaattat aaatacttaa
                                                                       1860
aaatgggaat aagaagacaa cctaactacc tgaacagttt tagagatgac tcatgcccac
                                                                       1920
cctctaaaac ccaaacaaaa acaacaaagt caagaaaacc catgaaatct tagcaagcga
                                                                       1980
tttctatgta cttgtgaaaa ggatttcttt accattctaa tgggatttat gccaaccata
                                                                       2040
                                                                       2100
gagggeteag tgeceeteee atggggtggt tagtgagtae agagetgage teaceggeea
tctgcagctt catgttatca agctccagtt tgtccttgga gcaaggttat ctgggacatg
                                                                       2160
agcagaggca ttgctttctg caatggacag ttctttctgc ctgcatacct agctccttga
                                                                       2220
                                                                       2280
taactttaaa taccatttta tagccacact ggagttttga agacctcaat atgcaaatat
tactcaggtt ctgattactt gtctgctcca tgataacaca ctctaaaagc aatgaatggg
                                                                       2340
gcttatttgt agagaactga agcattttaa gcttttgctc aggaatccct ggtagcttcc
                                                                       2400
                                                                       2460
tgtgacttgc aagatattag tgatgggtca agaaacagga ccccccatca gcataacata
cgcagtgcct cagtagtcca tcaggcagaa aaaactgcag atggcacatg gaaatgacca
                                                                       2520
gcggcggaag ataccccgac agtgtgggca gttctatttc agcagcaatc aagagggggc
                                                                       2580
ctggagccac tcaatcaagt ggagcaggat gggagcaagc actgtgcaga ccaatgcaat
                                                                       2640
ccccagttaa cacaaaaaat aaataaaaga gatgagattc agtctcttga ctgtgactga
                                                                       2700
ctgggagctt tatagctgat gcttgtgtct tttctccatt ttatttaatt aggaaaagaa
                                                                       2760
atgcttatca cacactctac gtgtgaggta caacctccac aggaaaggtt gttaggaaca
                                                                       2820
tttcaacttc tagaagtttc taaacataag gtaaatccat ctttgtcctt gggatcactg
                                                                       2880
cacatctcag aaaggcaaat aaatcagtaa ttggtgggca taattactag ctcatggact
                                                                       2940
gacaaggtct acactatttc gaatctcaca gaagtaagcc atgggacaga tagagtctga
                                                                       3000
tagtggtgcc ccgtttcctg gaggtcacac ttactcatcc ccctggaccc tgggcttctc
                                                                       3060
3120
```

```
3180
ctccaatggc tcgcaccaag actagagatg caagtgcaag cacatccacc ctctcagcag
ccaggttttg cgttccataa tgtcacgtac ccccagtcat accaatctcc ttggagctct
                                                                            3240
                                                                            3300
ccagacagge tgccatgtgt ggtcggccct ctgtgcttgt gctccttggt ttgccaagcc
tggaatgccc tttctccatg attgtactct gggaattctg tgtgtctttc gagatgaagc
                                                                            3360
tectecacee tggaaattet geetetettt ceaggteeag eteetgtgge tgaataceet
                                                                            3420
tggctgactg aacattettg etgggeeaag tettaateat etetaaatee etetggtgee
                                                                            3480
ccgacagtat ctagcccagg caaagggctc agcaaatact tgcaaaattc aataaacttt
                                                                            3540
                                                                            3600
actatgttac tagcttggca tgatgttcta ggcacttggg agattataat ctggtgagca
ttgtgctagt ctttttttg ggataaacac caatgataaa ctgagccttt actctcattt
                                                                            3660
tagcacatct actcatctct tttcaatgct ggtgggttta taaaacccat cagtagaaca
                                                                            3720
gagagtgatc ataatcatat ggtgaaaata acatcagcta acatatttac tgaacatgct
                                                                            3780
                                                                            3840
ttagtgtgct gggcactgaa ctctgtgcac atgtgaattt gagatagatt gttcctagct
                                                                            3900
aataagatga ggaagtggag atgggcttac tcaagtcaca caatagcaag atggggtaca
                                                                            3960
gacagaaacc aagctagaaa ccaagcaacc cctgggtttg gaaatgcatg ggctcctcct
                                                                            4020
ctgcacatgg cgaggagcag tcaggtgctc ctccttctct catactgaaa taactctgca
cttttggcta ttctgtgaca ctctgtgcta ttctgtagct caaatggctc tggtgcaagg
                                                                            4080
agctcagatt atgactaacc cccatagata ttcagctgct ttgcaagaag tggatgaatg
                                                                            4140
ctctggcttt ataaattatt gactagattg gatattggcc caatctccac tctggtgatt cggaaggagg catatgcaca tttgcaaggt tatagtagtg cactctaatt ccactggctt ctgagagctt gtaggtttct tgacttaatc attctggaat taaggtaatg gatcctcaac
                                                                            4200
                                                                            4260
                                                                            4320
accttttctt tccctggcct ttactaacca tgtaacagaa atgagcagag aaaacccaag
                                                                            4380
aaagcgaact ggagacttga tgagtgtgtc aaagatgctc agagtccaag gtcctctgtg
                                                                            4440
gctcactgac ttcagaagcc aacctccgtt gttcaagtca cttgtgaggt tactatgcta
                                                                            4500
                                                                            4560
gagcactaaa tattatccag atagcccaaa gaggtgaagg cagacatgtg gaagaacctg
gatttttggg caagttgatg aatgcctcct gccccatatc aaagagaggt gataggagac
                                                                            4620
                                                                            4680
aactttgtga atttgaaata atgcaccggg gaaacaggaa aacgtaatgt aagtcacgct
tcttggcttt tttcttgcca ttaccctact tggccaagtg caaatgggat ttcaatatat
                                                                            4740
cataagtatg catctattaa taacaatgca agaaagctgt acaactgaag tctgagattt
                                                                            4800
tgtaagaaac agaatetetg taagcateac catecaacag aactteetga gttgatgetg
                                                                            4860
aatcatccca gaaagaaggc gcgccagctc tgcaggatct tcaagtctgg ggtgccacca
                                                                            4920
                                                                            4980
gcaagcgacg gtcctccatg ggctcttcac cttacggcag tgtccagagg caccgccagt
                                                                            5040
cctctgctcc tatgctggtc ctgctgtccc tggcaaaagg agccagagca ttctctccag
gcctcccgag gaggctgctt cctttgtttt gcagatggag gctcccatcc tttgttctga atcaatgtgc tccaaagata agccccaaga aaacagttgt tgccttttga cactgacaat
                                                                            5100
                                                                            5160
tagaatcgtt ggaaaatgga gaaaacagga aatggcaaat ggtttcagtg accaggagga
                                                                            5220
                                                                            5280
aaccgtgcct gaaagttgct gcttagtgac tgggacactc gctttctgct ctcttatgaa
ggacagecta ggeegtgtgg cettttataa acaaagetat gaaggggteg teaaatttte tagggetgea actgtggeae taegteetgt tgtgeeaggt gacactgaea ageageaetg
                                                                            5340
                                                                            5400
agtictatge aageceaggt gtgettetet catggtgace eccagagaac taaggeecag
                                                                            5460
                                                                            5520
ctcttcctct gtcacacccc tcccagcccc cactgtcaga caagggacca cattcacaga
                                                                            5580
cagtctcagc caagatggca accttggaag tcctggggat gcctttctag aagctttagg
                                                                            5640
ctgacgccag ggagctgtaa agccccacc tgtccctggg ggttgtgtgc tgggcaggag
agaggggaaa gagcccaaac tecaccactg cetgetggca caactgagce cacgccagge
                                                                            5700
actgcaccag cttcactcac cagctaccac atgctaatgt ctcctgttta cccaggtgca
                                                                            5760
atcacctgag tgctgctttc tcaccactgc atgggaagaa cgatctcatt accaattcaa
                                                                            5820
ccacttaagc aggcaaaagg actccaacgg gggaaaggca gaggacaaac gattcgggga ctgagacaga tgcccacaaa atgttcctgg attttagccg gattcgggct gaagttcctt
                                                                            5880
                                                                            5940
gccctatgag cccttggagg agagcatcct gactcagaca agaattcaaa tgacaagact
                                                                            6000
tctgggggat ggcagtgaat ggatccaaag ccttgtttta taaagaatgt ggaggaaggg
                                                                            6060
aggaaggaag ggagggaagg ggagactgag agggagagag aataaagaag aggaagagaa
                                                                            6120
ggaagaggag gaggaggaag gggagggag aggaaaaagg ggagggtaga ggaggaggga
                                                                            6180
gaaggggaag ggaggacaga agaggggagg gagcggggag attatctacc cctccatgct
                                                                            6240
agggaactec tgteteettt teeageagae actgeteeat gagtgeeece acagagagee
                                                                            6300
agcctgccac acagcagaag gtgctcagct atctgtccca aaggttgagc actagtgtat
                                                                            6360
accacaagga aaaaaacctt cttttgtact gtttggaagc cagaattaga aacaactcgt
                                                                            6420
tcacccttct gactttccct ttgcaatgac aggaagatag tatactgcat gggaccacca
                                                                            6480
cacattcaag atctgagttg tggggacccc cacccccaca tgggtggagc cccctgagac
                                                                            6540
ccgtgggctc tgactggcca tggcccatag atagtgacaa catacacact gctatctgaa
                                                                            6600
gcctagttgg aggacggatg gatgctttta ggaaaaaatt ccctttagtc gtccctcaga
                                                                            6660
aactacaacg gcttcctaaa atgaatggca ggcaagtttt gattgtttcc taagttcccc
                                                                            6720
ctaactetca gageetgtga etcagettet ccagaatgee tgeagggagg caggaceaet
                                                                            6780
gggagtaatg agcacgaatt gggccacttc tcccagtgga ctgttaacgc cgagatctgg
                                                                            6840
```

```
6900
ggtggaaccc actgaacacc tgcccttttg cgttgcccag aatgcagcca gagggatacg
ggccacagta actotggggc cootgaacot acottoccaa gaccotgacq ggaaggtatt
                                                                         6960
                                                                         7020
gcttacatga cagtccagtc agtccctctg tcactcagtt aacaaacatg gtcatgggtc
                                                                         7080
tactatgggc caggetetgt teegggeatg gggataacac egtgtgtete tactettatg
                                                                         7140
gacacaagta aatcaatcaa agcagataat gttctaatga ccacccagta gggtgaaggg
atggagggtg ggcaggtgct ggcagaaacc taaggtcaag tcatgggacc ccaatgggga
                                                                         7200
actggaaact gccacaccat tttctatgtt aggggtcttt ccttgccctt ctagagacct
                                                                         7260
                                                                         7320
cacccatggt aatgatgctg ccctcaggtt tgaactggtc tgaagctgtc actgggggct
tcacaaaatg aatgccactg aaagcaaacg gcagagatct gtatatgaaa ttctttttac
                                                                         7380
cctttgtttt ctgtcttccc acatgatcta tgactgctgc aaactctatt ctgactcctc
                                                                         7440
                                                                         7500
ctcagtcttg gccggtctgg gaagaacttg gtttagatgc tgggaatgat cccgggcaaa
ggaaacaaat atatttccag cttgcttttc ttcttcccct gtggtgcctg catcctctgt
                                                                         7560
                                                                         7620
ctcgcactga ctcacaggct ggactgacaa agtggctgtg ttgacaggga ggatttagtg
gatgccaggc ctgaccctca aaggccctca ggtggggcca atttccaagg ttcttagaga
                                                                         7680
                                                                         7740
agatttgggg ccacaaatct gctctgccac ttcactgctg ggtgaaagct gttggcttga
gaagagagag aataggtgag ggacaataat tctcaaggca agctagctga tatcctttca
                                                                         7800
                                                                         7860
tttgtggctt ccaaagacag ggaaaggcaa ggcagaccag ggtggaaaca gcgacatcct
gaggggacga cgtccgtttt gctaattctg tttccctggc agctttgtgc tggacaagat
                                                                         7920
ttototggtt toagotgaag agtgaacago tgaggagoto tgtgactotg agagagagag
                                                                         7980
aaatcaatag cccttgaaag gaaagcactg cttgttcttc caggccaggg caggcaggat
                                                                         8040
aaagagaaca aggctgtaca taccaaagcc gaatttccat taaaggccag aatcctggga
                                                                         8100
ggccctttca gcttaatgac catcttctga tcactatcac ttagaaaatg ttcatgtctc
                                                                         8160
cagttttctc tgcagatagt gcagacatcc tgtgcacatt gatattttat gcaccagatg
                                                                         8220
caattetetg caaaggteee etetggetgg tgtecateeg ettgetetea tgaecaetga
                                                                         8280
tgcgactctg ggggcaagtc aagccattcc ttctagactc tagaatctag aggatgatcc
                                                                         8340
caactcacag gcctcttgga caagcttgct ttggattcct tctgcctgta ctacccagac
                                                                         8400
tgccagtcct ccagcagggc aatccaactt cctgcctcta gggtgtggga gtcctgggcg
                                                                         8460
                                                                         8520
gggtttggaa tccacagcag atggctggca ggagaggcag ttcccgagca cccactaggt
gccaagcagg caggtatcag gtgcagggct teggaggtgc agaagcacag cccctgtccc
                                                                         8580
cctcaggttc ccagtctggc ctcagggaca gacaggcagg taggtatgga aacggggtac
                                                                         8640
                                                                         8700
tggaaggcat acagctgagg gagagagcag ctgcaccctg gtcaatcccc cactcatttc
cctggaggtg gggctgaggc acctggagca ctctgcttgc ttgggttgtc cctttgccaa
                                                                         8760
agaatgccgg gcagaaagta gagaacaagc aggcccagga agcactagaa gtccctcatg
                                                                         8820
ggtggacaga getttacett eggagetgte aceteetgtg tteeteecaa caaceetgtg
                                                                         8880
                                                                         8940
aggcaggcgg gcaggctgag caggggactg tgccccgttg acagatgagg aaagcgaggc
                                                                         9000
tcagggggaa gtgacttacc tgtggcgtcg cagctaggca gtagtggagc gggcacctgc
ctccaggect teggatecca getgeeccag ggegetgeet etgaggtget gtacgaggag gtgaeteggg ccageteatg ageaaaggag etgeegggea ggaaggaete aeteeccagg
                                                                         9060
                                                                         9120
gcctggcagg acgggggctg tcgcccgagg ctgacctggg ggtgcctggc ttccccaagc
                                                                         9180
ttgcaggett tgtctacatg agtctacaac aaccgattga acaatccatc agctgettgg
                                                                         9240
                                                                         9300
ccacaaaatg gttctgactg atcttgtcac tgccctgagt gtctagctgg gtcatctggg
                                                                         9360
tgttgtggtt atacccacca actgctttgg tggaacgaaa ccgcggccga tctgaattca
gateggeege gggateatte etggaeteag attgttetga agaageeeag ttetgggtgg
                                                                         9420
catcaagtgc ttgctagatg gggggcttgc cttgatccgg ctacacttgg aggtgacttg
                                                                         9480
ttcttggacg gctacataca gaaagagaga agttggggatg agttccaaag gcatcctcga cttcggctgt ggccaccgga gggtagctcc tggcccaaca cggacttctc acctcccgc
                                                                         9540
                                                                         9600
cttggctctc tactgagetc ceceetgetc eccaattect egecattece etcatttete
                                                                         9660
tgccctcagc ctggactgca gttcttctgg gaagctgccc caactcccta ggtctgtgct
                                                                         9720
                                                                         9780
caccaagage agateacact ggaetgaaat geeagetgat ttgtetette aagaaaattg
gaageteetg gaggteaggg tecatgtetg ettttacaet eagtgetetg tatgeaggee
                                                                         9840
tggcactgcc caccetttga caggtggtgc atattttgta gaaggaagga aggggccagg
                                                                         9900
tggggtgggc tgggctggtg gcgggagcta gctcagcctc ttagattctc tacccgatgg
                                                                         9960
atgtgacctg ggacagcaag tgagtgtggt gagtgagtgc agacggtgct ttgttcccct
                                                                        10020
                                                                        10080
cttgtctcat agcctagatg gcctctgagc ccagatctgg ggctcagaca acatttgttc
aactgaacgg taatgggttt cctttctgaa ggctgaaatc tgggagctga cattctggac
                                                                        10140
tccctgagtt ctgaagagcc tggggatgga gagacacgga gcagaagatg gaaggtagag
                                                                        10200
teccaggtge ctaagatggg gaatacatet ecceteattg teatgagagt ecaetetage
                                                                        10260
tgatatctac tgtggccaat atctaccggt acttttttgg ggtggacact gagtcatgca
                                                                        10320
gcagtcttat ggtttaccca aggtcaggta ggggagacag tgcagtcaga gcacaagccc agtgtgtctg acccacccaa gaatccatgc tcgtatctac aaaaatgatt ttttctcttg
                                                                        10380
                                                                        10440
taatggtgcc taggttcttt tattatcatg gcatgtgtat gtttttcaac taggttacaa
                                                                        10500
totggcotta taaggttaac otootggagg coaccagoot tootgaaact tgtotgtgot
                                                                        10560
```

```
gtccctgcaa ctggagtgtg cctgatgtgg cactccagcc tggacaagtg ggacacagac
                                                                             10620
tccgctgtta tcaggcccaa agatgtcttc cataagacca gaagagcaat ggtgtagagg
                                                                             10680
                                                                             10740
tgtcatgggc tacaataaag atgctgacct cctgtctgag ggcaagcagc ctcttctggc
                                                                             10800
cctcagacaa atgctgagtg ttcccaagac taccctcggc ctggtccaat ctcatcccac
                                                                             10860
tggtgcgtaa gggttgctga actcatgact tcttggctag cctgcaacct ccacggagtg
                                                                             10920
ggaactacat caggcatttt gctaactgct gtatcctagg ccaataaatg ttgatcacat
                                                                             10980
ttatagctgc catggtaggg tggggacccc tgctatctat ctgtggaggc tctgggagcc
cctgacacaa actttctgaa gcagagcctc cccaacccct tttccattcc ctatacctga
                                                                             11040
cagatggccc aggaacccat tagaaatgga aggtcactgc agcagtatgt gaatgtgcgt
                                                                             11100
gtgggagaag ggcaggatca gagccctggg ggtgtggcag cccccaagtg attctaatcc
                                                                             11160
agatectagg gttgtttece tgteceattg aaatagetge tttaagggge etgacteagg
                                                                             11220
gaaatcagtc tcttgaatta agtggtgatt ttggagtcat ttagaccagg ccttcaattg
                                                                             11280
ggatcctgct cttagagttg gatgaattat ttaactgatt ttcagatctc ctctttctca
                                                                             11340
atgettteag aageacagta actgettaet etgaaatgaa tteteacece actteeacat
                                                                             11400
atgcacccct tgcccacccc tttgggaaca ctggccttaa ctgcttacct tcaaatggac
                                                                             11460
tcatctgttg ggagatatat gcattctgcc gttcaggggt cattgccata agacctgatc
                                                                             11520
                                                                             11580
tctgttcctc ttgctaaaca gaagatgaaa aagacaaatt agattacagc taccaattaa
taattagcct taggatcgct gcgtggggac ctaggacttg gctttggtgc agcagaaagc atgaataaac acaccagcat acactcgcat gcatgcccca ccctctcgag caaaattcca
                                                                             11640
                                                                             11700
caggtataaa taaagtaaga ttctgcacct gggttaaaaa cacaactgca acagcataga
                                                                             11760
                                                                             11820
atggggcagg agagacagaa cttaatagca agagcacaca gaaaaaagtt ttaggcattt
tggatgtcca tctgctcagg atgggtcagc agtgagatgc ggtcaccaaa agaacaaatg
                                                                             11880
                                                                             11940
taacattagg ctgcattaat agaagcagag tatgtagaag gagggaggtg acagtcctat
gctaactctg ccttggccag actataccca caggagtctg ggcatgccag tctcagggag
                                                                             12000
acccagacag actggctgca ttcagaggat ggtaagtaat gagagtgggg attggacttc
                                                                             12060
aaactaccca gacaaagaat ggctgagcaa gccaaggatg ctgtggctgg ggcagagcag
                                                                             12120
actgtgggct atgtagtggt ggatacctag cctctgcagg gctgtcatag ggaaaggaca ttgagaagag gactgaggct tgttcctggt ggtcctggca tgaacggcca gatgatcaca
                                                                             12180
                                                                             12240
tggtcaggtg gacacagtct ccaacactgg gagtagccaa acacttactg ccaacctccc
                                                                             12300
                                                                             12360
gcccttctcc tgactagttg cagcataggc aattgggagg agcttcctgt ctccatctga
aagctggctg ggtgggcagg gggaggagcg agccaagttt caaggccgca gtttcagcac
                                                                             12420
tcagtctggg atcggctcaa ggagcaaagg ggaagaacat agccaggagg gaataacatg aaggccccca gacccagaaa aggcatgact tgctctgaga ccctcagccg gttggtgtca
                                                                             12480
                                                                             12540
ggttgtgact cggatccagg tctgactccc agtccagtgc ttgaagcctc accccacaca
                                                                             12600
                                                                             12660
gtgaggggag cccggccatc tctgctcaac tgctgccatc tctctcccct tctcaaccac
caaggcagct ctgtctggga gcacaagctc caagtccact ttctggtctg tgtcccccc aagatgccag aggacttgcc tctacaacac gggctgcccg tgcagtgcct gcttttccag caaagggctt ctgggaaccc ttctctgcac tcagtgggc tggtgggagt gggggggt
                                                                             12720
                                                                             12780
                                                                             12840
                                                                             12900
agegacecag tgettgggae tgtgeecage teteaggeet ggeageagtt cetggeettg
                                                                             12960
gttcctgcca aggcagagag gacaaacaca tggcaccggg aagactacac cagaagcgat
tccaccagac tggggtttgc ttttctatcc cgcccttagc ctgcttcctg tcctggtccc
                                                                             13020
tgcctcccc tccactggag ctgccgtgtg ggcagtgagg ggctgtttct cagctgccct
                                                                             13080
atggagctgc cctctccctg ccaaagcatt ggcaaggcgg caaggggtgg gggtggggat
                                                                             13140
                                                                             13200
ggggggtggg atctgccttc tcaagctctc attatactga gcacgtctca cccattattt
tatgtcatct agcaacaccc catgtggaca ctgaggagca tggggggtcac atgaccactg cccaaggcca caccatccgg atctgcctga gatggtcagg gttggcagcc atttctgaag gcagtccttt cgctttggct cttcttgtac cagtctcagg acatcagggc agaagatcta
                                                                             13260
                                                                             13320
                                                                             13380
                                                                             13440
cagtccccag cttactgatg tgacagcaga ggctcagaga ggttaaatga cttgcccaag
                                                                             13500
gtgacacggc taagaagtac agtatctcct aactgcagac caggtgcttc tgctgcttct
ggggacagat tcctgcgtgg ctggctaggt ctaaacggtc cttaactcca tccccaccgg
                                                                             13560
                                                                             13620
ttgctgcatt agtttcatca aataacacag ttgtacagag gtaggggttc aggggcaggg
                                                                             13680
gcagatggag gctggagagt gtgactaagg aaacagcagg ggaagtgcgg taaagtccga
                                                                             13740
agggagggac ggaaagagaa agccaagccc aggggcgtgc cagacaaaag gaaaggccac
gccggggcag ggcaggcttc agcgggtgct ggggcgtctt catcccggga agcacacatt
                                                                             13800
                                                                             13860
ccagaggacc ccggagtcta atggaaaagc tggccagcct atcactatgg aaactgccaa
ggccacacag cgctacgcgt atttaaatgt gctggagtgt tgagatactg tagtggtggg
                                                                             13920
                                                                             13980
atgcttaagt gctggggtgc tgggtgttgg gatgcctagg tgctggggtg ccgagatgct
                                                                             14040
ggagtactag tgtgctggga tgctgaagtg ctggggtcct gagatgctgc agtgctaggg
                                                                             14100
tgctgagatt ctgggctgct ggagtgttgg ggtgctggga tgctggagtg ctgagatgct
                                                                             14160
tggacaatgg ggtgctggaa tactatggtg ctggggtgct ggggtattga gatgctaggg
tactgggatg ctgaagtgct gagatcctgg agtgctgggc tgctgggcca caggctcttg
                                                                             14220
                                                                             14280
aatccattcg tctgcccagg ggaagaaacc agaagataaa gagctaatga aggagctttg
```

```
14340
gttgagaggg aggaagtaat ggaaggagca acatcttgtg gaggagcagg agagaatgga
cctcaggttg ggagagggg ccaggctaca ggccagagag gcagaaggat tccagcagag
                                                                         14400
                                                                         14460
tgtgggctcc aggagccaag gggaaacagg tttctgggag gagagagtcc agtactgctg
aagtggcaag tccgctgagg accaggaagc ttcatttggc tttatgacca ggaggaattt
                                                                         14520
ggaactgtga ctagagtact tagggggaag gaggcaagac tggagccaga ttgctctggg ttgaggggtg agtgggaggt gaagcagggc actgtcactc ctttgaaggg tggcagagag
                                                                         14580
                                                                         14640
                                                                         14700
ctggaattgg tgctggatgg gctgtggggt gacagggtca tgtggaaagc ccctgggggg
                                                                         14760
cacctggaaa aggagaagct gacagtacag tgagaggaca gctaagggaa agcggaatgg
cagaacacgc actgccagga ggaatgagga tagggtcagg agtgccaggg gcagtgaggc cagcctgggg tcaggtggca ggacgtgtcc aggaagctgg tctgcactgc agcccacact
                                                                         14820
                                                                         14880
ggctcagcct tgaggttccc tgtgtggttg gggtaggaag ttgaaccctc tgggaatgga
                                                                         14940
agatggaacc agctctgcga gccaagctca gcttttatct atgggtctct gagggctggc
                                                                         15000
                                                                         15060
agagctgagt ggggacaact gtgatccgtg aggctctcag gttgaggtgg cccctccggg
agggetteat ttteccageg ggtaggttet aageageagt ggetgggeag gtgggteeaa cacagageea gagaagggtg aatgggeete etggeaceee acceetgetg eccetgaget
                                                                         15120
                                                                         15180
cagtgatgga gggggacagc acagctgagc ccaagtgctt tggtgtggcc ctgagggaaa
                                                                         15240
                                                                         15300
gctgcagcct gcctggggcc tggcatggat gggacacttg aggcagaggg acaatagtgg
gcgctgcagt gaggctggct cttggagagg tttcctgagg agtgctgcct gagacgggca
                                                                         15360
                                                                         15420
gggagaacag agacaaagtt ggtgacaggg aatgaaagct gactgaagga ctttacccag
acctatgagg atatetetet cageaggaag caggagggga etgtgtgagg actggecaag
                                                                         15480
agetggagtg ttgggaaaat gactetttet eegaceeete tgteetaget etggeeeetg
                                                                         15540
gactgcggag gtctgcttcc accccattg gtcgatcgtt gtcccttgtc acagccattg
                                                                         15600
agaattttgg cagggagcat gttcttagag catttttagg ctctgcggga cataacagct
                                                                         15660
ctgcctcaga gcacatgcct ttctcagctc ctgaaagcca ctgatcaaat tggaacattt
                                                                         15720
tgtaccttag ggatgaggat atcaactctc ccagccactt agagggataa atgtgatgat
                                                                         15780
                                                                         15840
gcattcaatt gtgactacat ctgatcccaa ctgttgcttc agctgctctc ctatagcaca
tggcgggagg cgtgcatccc agtagctacc tccccacttt tggggagatg tggttccatc
                                                                         15900
                                                                         15960
catgaaacct gggtacccgc ctaccaggtc ctggcctatc aggtggcagg gtctggtcaa
agaagggcat gtgtggtctt cagcaaggga gacaggacgg tggtgcagag cgtctagacc
                                                                         16020
ctcaqqqcaa qtctccccca cacctgctcc cggggcagtt gtctttgtga cctcccatcc
                                                                         16080
                                                                         16140
ccctctgttt catcctctat aaaatgaggg gctgagcccc aaaataacag gcttctttgc
catgatgcaa aactgctgaa tctttctttc tgacacacaa ggcatcgagc agcctctgaa
                                                                         16200
agaaccaaag ccactagcag gcttcctgac ttgggtttgt aggtactgaa tactcccttg
                                                                         16260
aaaaataaaa acatagaggc acttttctcc tggctgttta ttacagaacg aagaaaaaac
                                                                         16320
                                                                         16380
acactggctt gaaacagacg ccagatttca aatgtagagg tgaaatacga ggtggcaatt
                                                                         16440
aaaatgtgat tacagaaagt ctggacactg agaaaagttt acaggacagt gggtgtgggt
                                                                         16500
tttctataac agacacttaa atatacatga cgataattgc agatagaaac catcaaagac
aaaccccaaa tcaactaata atgtttacag atgttccccc ccaaaccaca gagccttaca
                                                                         16560
tcaaaacaaa tactgaaagg ctttaaacca ggaacagctc gccttaaccc cacgagggtg
                                                                         16620
cacacaagct gggctttttc tctcggtctg aatggtaaag ggaggaggat actctagctc
                                                                         16680
                                                                         16740
ctccaggtgg attgctgaga cagggctcgg ctcacacact gtctctgcgc ctctcccaaa
                                                                         16800
tctggagaac tctcccagcc tcctggtaaa gtgtctctgt ggggcactta acgataaaac
agcttctgct gtaaagctca ttaggaaaga gctagcggag actgaaaggt tcgcaaaaga
                                                                         16860
gattaagaat cacacaaggc aataggattt ttagtgaaca tagaaataaa tggccaagtg
                                                                         16920
                                                                         16980
gttttctatt tggcatttgt caacttgcac aacaactctt ggtcatatcc acattgctca
ttgcattaaa accataagcg actcagccac ctagcttaac aaggtatcac tggagcaaac aacacggtct gcatatttgt aacattgtat aataaacaca aaacaatgca tagtaaacac
                                                                         17040
                                                                         17100
aactctactg aaacaaaagc cgtcgcttta tttacaaagt cacaaaatga agtataaata
                                                                         17160
cttctgtcat taatgtttag gaaaaccatt tacaaaattt tcaaatatgt acacgtagct
                                                                         17220
tgaaaaatca ccagctttcc attttgtcac aggtagagag agggataagc atgggctgac
                                                                         17280
aacaccactc aaattgtaac gggagacaac tgcgggtatg gatcgacacc acttcctaga
                                                                         17340
gtgatgtcac catgggggtt tctatgggca tcctgctcag atttaaagtg ccccagcatc
                                                                         17400
ctgggtgact tgcccagaat tctgggctgt ggcattttga gcagcagcat gctgttccaa
                                                                         17460
                                                                         17520
aatgtcgtcg atcagcctca agttgcacac ccagtcttca tctgggctca cacaggagcc
tttcaagaga gcttcaatga aatctacctc attgcagtca ggtgacgaaa tcagatcatt
                                                                         17580
                                                                         17640
tagtgggggt tggggctggc gcaaaaagtc ggcaggtggc agctcagggg gaatatccgt
tctgtcgaac ggacctggga actggctggc agcaacggca gaagcagcag cagcggtggc
                                                                          17700
                                                                         17760
agcagcagcc acatagcttg gtggctcgat gccctgtatg gggctcaggg gactaaagct
                                                                         17820
ggccataccc tgctggagga acttggtggt gtttgctaca ggcaccgggc cctgtaccgg
gctctgcctg aggctctggc tgcccagcag gctgaagctg gggttgttgg ccaggggcac
                                                                         17880
ttgtgttccc atcgcagcgg gcacttgtgc ctcccaatca gatggcctct gaaggcaggc
                                                                         17940
ctggccagaa ggtgagtgct gctgaacgct attatccact tggctgaggg gtgttttccc
                                                                         18000
```

```
18060
cgaaactgct gtggtcacag ctgctgccgc tgtgacccat gcagcattgt tgaacgcagt
gggcattett ggcacactag geogtetgag etggtgggga etcaaggaet gggtgeecag
                                                                           18120
ggagctggga cagaacccag gcaggggcac ttctggtggg gtggccttgg ggctctgcat
                                                                           18180
atgctggcag acagagtcaa gtctgcccag gggagtctgg cctgagtgtg agaggatggg
                                                                           18240
acactggggg ctggaggtga aaattccttg ccgcttcccc agagttggtg agatcactcc
                                                                           18300
                                                                           18360
catgcccggc gcgcgcgtcg acgtgagcaa gtggaatgga gtggcaggga atgagtgagg
gagacaacag ctcagtagga ccttgtgggc tactggaaag actttggctt tgactctcag
                                                                           18420
                                                                           18480
tgagataagg aggtatttga aggagtttta gcagagaagg aacaattctg tttattttta
ggagctcttt atatatttag gaaattactt ctttgttagt catatatttt ggaatttgtt gttccccgtt tgtcatttct gtttctacat tttgcttata atatttgtct atgtaaacct
                                                                           18540
                                                                           18600
taatatgtac tiggttaaat igataaattc ttigcataat taatagctag ctattgttgg
                                                                           18660
cctacctata attaattttt gctttatcta gtaataggcc tgaattttca tttgggatcc
                                                                           18720
                                                                           18780
agccctctcc ctgacactat gcagggcctg ggagactaaa gcctgctgga aataactcca
gettggeeet geeaaacatt acaacaceta geacetgete tecceaceat agtgaetgat
                                                                           18840
ttgggcagga atgagaccac agccactcca agagcccagc tgttggctac cagtaacatc
                                                                           18900
ttctcctcta aacaggagat ccagctatat tgaaggcttc caaaattacc ctatgtctac
                                                                           18960
ctgtcacagg aatgttcaga ggactaagcc tctgcctttc tccaccccat acttacttca
                                                                           19020
tatggaacta tgaatgggca acttcacaat ttattattta cgtcacctag atgcaagtca
                                                                           19080
gagggagaag caacaaatca gcagtaccta agaagttctc aagtcctcaa ggtgaacttt
                                                                           19140
acctatatat acaaaatata tttgcctctt tcctttaacc ctttttctta ctcccaccac
                                                                           19200
tttccaccca atgtgtaata atattagtca cttcatagag ttcttatgag aagttaaatg
                                                                           19260
aggaaatcat gtaaaccact gagggctggc aacaagttct taataagtgc tattgagtta
                                                                           19320
tgagtattat tatctccctt gggctggatt cacagtgtca cctcttctgg gaccatagta agccaatggt tccagctcct tctattatgt cattttaatt tggggaatag cttaacatat
                                                                           19380
                                                                           19440
tagatgatec tttacatgec tgageggtet ttetttgatg gtatttetat gatettatga
                                                                           19500
                                                                           19560
agagctagat gttgccgctc cattttatct tgctggtggc agctggtgtt tagccaactt
gicttttitt ttctgtcttt atatttttgg ttttgttttt tggcagaagc ctgtgttttt cagattactt tttgcttgtg tctacttttt cccaaaacaa tattacatat taaacttatt
                                                                           19620
                                                                           19680
gtatatttaa gtttatttta tgcatcaaaa gtcgcattga atttctgtgc tattgtgggg
                                                                           19740
caaattgaca tcaatgtaat ttaactcatt ttatcccaaa ttaggctatg tctttccata
                                                                           19800
                                                                           19860
tactcaaatc ttcttttatg tccctcaaca gtttccttca tataaatatt gcatatttct
aattaagttt atttttctaa tctccatttt ggatgtctta aatatagtct tttctccctt
                                                                           19920
tgctctttat caaagatctg caaactatgg cctgtttttg taaataaagt tttgtaataa
                                                                           19980
agtttaaatg gccactccca tttgtttaca tgttgagtat ggctgctttc agactgaaat
                                                                           20040
                                                                           20100
ggcgaatgaa gtggtcataa caagaccata tggcctggaa agcaaatata tttattatct
ggcaatttac aaaaaagtt tgccaacctc tgctttatat tittgatcta gttgttattt gaaaataaag ctattgatat ttgtatatta attttttacc cagctacctt attgtttta
                                                                           20160
                                                                           20220
ttacttaata gtttacagta tttcttttag tttttccagg tgtaacatct gtaaatatta
                                                                           20280
ataaatctat tagctaatat ttcatttagc atttttatat ctatactcac atgagaagtt
                                                                           20340
ttctttaatt ttcttttgtg tttatcaacc tgtgttcact caggaaaatg aagccactta
                                                                           20400
                                                                           20460
agtataccag gagtggaggg tttcatatag aaatgagggc ttatttgaat tttgggaaag
ctgatgaaac aggtcagcag agttactgca gaagaccagg aaagttacat ctggaaggtt
                                                                           20520
agggaagcag acactaaaga cttaagcctg aagcatagaa gtaaggatcc gtcaatactt
                                                                           20580
attgagaaac ttctggaatt ctcaagaacc tctgagaaat ctcccattct gtggcaataa
                                                                           20640
agtggtggta ctcaagccat caccaacatg gctcatatgt ctcattgcac tatgtccaaa
                                                                           20700
gacaaatggc ctctgcttct cttctgtctc ctaaatctct taagatttcc tcttatttgt
                                                                           20760
ttaagtetaa cecagaagae ttacatggea ggtaattetg ggaaatgtat teeettgttt
                                                                           20820
ctccaaaggg gtggggataa taccaagttg acaacagaaa atctagcacc ctttttaagg
                                                                           20880
                                                                           20940
ttttggcatc agtgatttct tggtgctcta aatagttctt atgattattc catgggtgct
taaaaagaat atgtattete tgatttaaga atatgtaatt gatttaacta ttgattagat attaataaaa tagatttta aattacetta ttaatttggt taagteetee atgactaett
                                                                           21000
                                                                           21060
attttttgac tatttgttat ggaaaggtgt agctaaataa atatagaact actctatatg
                                                                           21120
tgtttctagt tctctatgta ttctctacat tttgctttat aattgttttc tttcttagag
                                                                           21180
acaggggtct tgctgtgttg cccaggccag agtgcagtgg catgatcata actcactgta
                                                                           21240
gccttaaact cctgggctca agcaatcctc ctgcctcagc ttctcaagta gatgggacta
                                                                           21300
cagaagtgca tcaccacacc ctgctaattt ttttcttatt tttatttta gtgatggagt
                                                                           21360
catgctatga tgctcagagt ggtcttgagc tcctggcctc aagcaatcct cccacctcag
                                                                           21420
ccccctgagt agctgggatt ataggtgaga ggcaccatgc ctggatttgc tttataaatt
                                                                           21480
ttgatatgtt acttggtgca tagatattca ttgctgttag accttcatta tgtgttgtac
                                                                           21540
cctgcccttc tttggttcac ttttccttga attcagtctt gtctgatatt aattttcagc
                                                                           21600
tgtctgcttt cttcttattt ccatttttct aatatgcttt tgcctactca tttgctttca
                                                                           21660
attttttctg agtcatttca ttctagatga gtatattaca gtcagtactt aattgggttt
                                                                           21720
```

```
ttctttgtca ctgaatatga gtgtctcttt tcctgtgtat tgatagggta gatatgtgta
                                                                         21780
gtatgagtgt tacaattttt taaaaaactt tgatttctct cctttgtttt atttggggtc
                                                                         21840
                                                                         21900
tccggttatt ttttaaggtg tatagtgtca ttttattttt aatgtttgcc tctgtaaaaa
taattttata ggctgtactt aatcttctat ttatttagct agtttatatt gactcttcaa
                                                                         21960
                                                                         22020
taacagtagt aaatgtccct acttctaact ccccttgccc tccacctttt aattttgtgg
ggtatactac tggccttagt ttttctagtg gttaatttta tacatttaaa taggtttata
                                                                         22080
ccttttaaac ttcaatggcc acctttaaaa atattttgac cccacccact ataaaaaata
                                                                         22140
aacatgccat cttacacgca caatctcact ttctctcccc ttacattccc taatttttac
                                                                         22200
tgggtatttt aatatttctt catcatcgtg gttgattaca tttacatgta tattgcagtg
                                                                         22260
gtagttccca taattgttat aacctttaac catagttcta catttatttt tgccaccgtt
                                                                         22320
tttcccattc accttttggt tcaactttat cttctagtag tgtcttcaaa aaagtgttct
                                                                         22380
                                                                         22440
tggaaactac agcccatgaa acattattgc atatttgaaa atatttatct gtcaccatta
cacctgaatg acaatttagc tagctcaaat ttactggctc acatcatctt ttttttggta
                                                                         22500
attitttaag tactictcta cigicatgta atgitigtatg taggatagcc taaagccaac tigigittit tiattitigci gitatagtag titigatcatt titigcctaga tigicccatag
                                                                         22560
                                                                         22620
gattattttt ctttgtcttt atttcaggaa accttactag actatggttc agtgctgact
                                                                         22680
agacattttt ttccttaaga aacaccatgc cctttagatc cttagattca aatctttttt
                                                                         22740
                                                                         22800
aatatcagta aagtttttaa atttacatat ttggatattt tatacttctc tagtttttct
tettaaagaa gaaaacatta attetgtett tgeetgtett eeatatetae aattttette
                                                                         22860
taatcacttt ttataatttc catttcattt tgctcaattg cctcaaagct gctatctatt
                                                                         22920
tttctgttgt caacaatctg tactcttaca tcagctacta tgataatatt gtgtcaccat
                                                                         22980
ttactactat ttacaagcta accataattt ctctgatgat tttagttttc tcttctactt
                                                                         23040
tgtgtcctag atacaggcag ctcaatttta atttttgttg cttttcttga ttccttatac
                                                                         23100
ctctgcatta agctcttaat tcacaaatta cttccattgt taagttattg agttcttaaa
                                                                         23160
caaatatttg gtcatgattt tcatctactc cacatcaaaa tgttcatact gtgtaggctg
                                                                         23220
tttgcctttt ttgtcctgct attttccacc attttgtgac atttttgtat ggatctcctt
                                                                         23280
gttcgttttt tattattagt catccttgag tgagcagaaa tcttcctaga gcaggtattt
                                                                         23340
gaaagaagta gtgtggaaga ggggctgggg ctgtgttctg cgttagtaga aaatccccta
                                                                         23400
attcttagaa aaatccttta tgattcatgg tcttgtggga gaaggttgtg aagcgggttt
                                                                         23460
                                                                         23520
tgtgaatgtg cttcatgtgc aatagagagt gactgagagg tggtttaacc tttcttctta
gctcacaaag aatggctgct acagagctgc ttaacaccca cagtttttct tctacatgct
                                                                         23580
gcacatttac aaagatggag tatccgtgag ttttctcact cattcctacc tcccctgcca
                                                                         23640
ttttaaagta tccaaggaag ttggggagat tccctcagct aaacagccac ccagatctta
                                                                         23700
ttgttccaaa caaaaaatta ttagatttgc cctctgagca ggtcacctac tttggagaat
                                                                         23760
tttgtgctct gccagctctc ctcaagattt ggaaaagcag ttattttcta ttggagcccc
                                                                         23820
catcactcca gtccaaagtt cactgcatgt gacatcccat cttatttgtc tggttcctga
                                                                         23880
ttataggagt ttcccagttt caacaaaaat actgtctttg tttttgtttc tcattcattt ttccccaatt ttgtttcaaa gcgaaaagta aaaacattct tactctaaca tcttaaaatt
                                                                         23940
                                                                         24000
aatgtctggg aggaacctaa actgctcatt aatatatgcc atgctatatg tgatatggca
                                                                         24060
gagactgcta cctgtccacc agaatctatt tatttttctt ggatgcacaa taagactaca
                                                                         24120
tttcctagtc tcccttgcaa ttacatgtga ccatgtcatt aagatttagt ggatgaaatt
                                                                         24180
taagcagaag caaggtgtgt aaattctagg gctggcccat tacaaacttt aacatgggca
                                                                         24240
cctgtgtgtt tttccttttc tgcttaattg ggttggagat aatcacagtg atgctgaaag
                                                                         24300
ccatgtgcta aagaaggcag agceteette tgcttggget cctgaatgae tgtgtggaac
                                                                         24360
                                                                         24420
agaggccctt gccactcttg ggccattctg gattattaca tgcacaaaga gtaaagttct
tttctgttaa gccattagat gtatgggttt atttgctgtt acagcctagt cgaacccaaa tgatgtagtg agggaggcag gacaaggaag aaacctattc agtatggagt tatccttagg
                                                                         24480
                                                                         24540
gacaagttac aaaaattata aggatcagac accactgctg gttgatccat tatagaccag
                                                                         24600
aataagcagg tggtatgatt ccagaaggag atgccatggt tgtgtgagag agagattaac
                                                                         24660
                                                                         24720
cattcctata aacagaaggg tcaaagaaag tagccagtca ccagaatgct tatattaagg
aggattgtga ctacctgtat ataaagtata ggaagaaaat ggggcagggc aattaagatg aattgcagac acaactattt gtgcatatta atttgaattt aaatttaaac ttaatttaag
                                                                         24780
                                                                         24840
gataatttaa aggaaaatct tcccttacct atttcatgct gaaggggtct ttcaagttgt
                                                                         24900
caaactctct ctatataaat aagactgcat aatccagacc ctccggaatc cagagatgaa
                                                                         24960
ttgcatgtgg tagctgatgt gtgggaagcc cacagagcag cacttctggt cattgccatc
                                                                         25020
                                                                         25080
cagctagctg gtgctctcag aagaatgaga tgaagaggca tgactttcaa gcttcctctg
ccatacaagg tgagtttggg ttccaggctt cttcctagcc cctgtttctg cttcctctga
                                                                         25140
tttaataccc agtcactgag tacctactaa acactcggca ttaaactgaa aagaacaggg
                                                                         25200
aagtcaaaaa ccttttacca atgcctgatg ggataaagac atgacccatc cctcaaagag
                                                                         25260
cttgtggtct tcccatggca atgcccttcc tccctaggcc agatggactg tgaagaacag
                                                                         25320
cagtctcaag tggatttatt gggaagctca tgaagactca gctcaatggg ccatgtttgc
                                                                         25380
aggggcccct tacaaggctc tgcacttgat tttgtaattt tgaattattt ttctcaaaaa
                                                                         25440
```

```
25500
ggcctcccaa attatgtaag cttcaggcct ttaaaacttg gatctgttcc cttgaagcca
cataatctga tcagaaataa ttttcagggc tcattgggtg ctggagaatt catggttaga
                                                                      25560
                                                                      25620
tatttaaata aaaatgcaga gaatctatag gactttccaa ctgagaccaa ggcttttttt
ttctggtagc ttgactgcca ggaaacagaa agcggggcat ctccacctgc tggcagaaga
                                                                      25680
                                                                      25740
ccaaaactac accatattgc attgaccgca gacatcaggc tttgtttcct tttaagtgaa
                                                                      25800
taggtgaaat caatcaagca aactggaatt aggaaacaga aggaccactc acaaccgtac
                                                                      25860
ctccacagca aagctaacac tttcattttg aataacccct ttccagcccc tgtttacatc
                                                                      25920
agtcacattt tttgcatgga cataatagtg tttcaggcag tcctgctcta cagaaggcat
ttgtttcgct gaccataagc atcttatgtg cttctacatt gtctttatag ccagctgtct
                                                                      25980
gaagttctac atcatccgtc agtgatgggt cctgagtaaa ctcagcagtc tcctctaagt
                                                                      26040
aacttgtata tatccctttt ataaagaatg ctgcagtggc cacccttaag tatagaactt
                                                                      26100
26160
ttaggagaag tgagattcca aaggacagag tgggctggca catatgtagt agaagactgg
                                                                      26220
                                                                      26280
acaaatgaga gtgaatgagc gagtctgttg tgagtggatg acacgcaatg caaccccaag
                                                                      26340
ggccggctcc aatttgcaca gtccctaaaa catcccaggg atccagtctt atcgcagtct
catcaacatt gacaataatc atttagagaa ttttcaccat gagacttttg acactctgct
                                                                      26400
ctgggatttt ggagttccaa ctgctttaac aatttataca gtcactcaaa tgtagaatcc
                                                                      26460
                                                                      26520
agtgaattat taatgacaat tttgctccgc atattgaaag ggcattctat attaatcaat
tataaatcat gataaattgc tttctaaaaa ttatacactt gaaacccaga aatgttcaag cccctcacca gtttacatac atccttaacc gtgtcttgtt aactgggtga ccaggaaaca
                                                                      26580
                                                                      26640
gagaaaggag gatgtactta atgaataact ggccagaagt cggaagacct agattttctt
                                                                      26700
cccatccctt ccatagattt gctctgtgac cctagacaat tcatatgccc cctctgttac
                                                                      26760
                                                                      26820
catactttta agctgaaggg gttatagtgc atactttctg aggtccttct aacactggag
atctatgagt tcataagatc acatagagtc ttggactttt cagagatcac taggcataag
                                                                      26880
aaagccctcg aggacatcct cttcctagat caaccactcc aagctaagac cttaatgggt
                                                                      26940
ctacactgtc atccatttat ataggagaga ggatggtaca agctaagtga aagtctgttg
                                                                      27000
tcaactcagg aactagggta cagttccagc aatcaatctc catggagggt tagcagaggt
                                                                      27060
ctggcctagc caattagggt ttggcactgc catatgctac tagaaaacac atgctttcat
                                                                      27120
gccaggcaac agggtgggaa gtgcaatgcc attaaggacc ataccttagc ctacttaaac
                                                                      27180
tagcctggga ttgagttact gagctcaaaa tacaattcag cacactttcc tgcccactgc
                                                                      27240
                                                                      27300
aagtcaggcc agcccctgga gaactccagg gacaaggcaa gtctggagtt tgtccccaag
gaactcccag tctagtggag gagatgggcc catagcagag ttacaaatgt ccaaaataag
                                                                      27360
agcacaaatt cctgggttct taaagagagt tcaagcacac acacacagag agagagaga
                                                                      27420
                                                                      27480
gcaatggctt cctgaggaaa tgtcacttgt gatgggtctt ttaggtgagt tggacattga
                                                                      27540
                                                                      27600
gagaaagtaa tcaaaagggc acaagatagg gtagctgtca ggtaaacaaa acaaaactgt
atgcacaaag gtctagaggc aagaaagcat gggtgtgctt gcatagcaat gaagaatgtg
                                                                      27660
gtttggccaa agcataggat tcacagaagg acctccccag gccatcagta gtctctcctt
                                                                      27720
cgcaggagtc cactgtggct ggacgaggaa cagatcaaaa caggtcttgt ttgaggcttg
                                                                      27780
gcccaacaac agggccagct gttgaccagg gcttccttca cccttagctt tctctcccc
                                                                      27840
tagtgtagtc agagactcca aaggcagtcc cagagtgttg tgccaaaaca aatgcacatc
                                                                      27900
                                                                      27960
aggetattgt catcaggage cettgtettg ttetgtttgt tttaagaaga cataagtgaa
ataaccaggt ttccgaagag agggcagaat tgggtttgtc cccagggaaa atgaggtttc
                                                                      28020
tocaccatgg ctgttctccc catgcagcag cggccagggg tccccagcag ctctttgctc
                                                                      28080
                                                                      28140
agtgcccctg atgctaggcc tgatgcttcc tatgtggtca gctcagatgt gcaacccttc
tccattttta ttatttgagc aatataatca ttattgcttt tgttacccaa aatcttataa tcacccattt aagagtaatg taggaatcat ttttctcttt tatttgatga actaatcttt
                                                                      28200
                                                                      28260
                                                                      28320
ctggttggct cttgaggtgg gaggggtggg caatggggac cagcctgctt catctcactc
tticctagge etgeteetta ggeaegtgee ceacaaatee caceteegea ggttggaaaa
                                                                      28380
ggggcccaca gaggatetea ggtatetgag gaagggccag aggetatttg geetgacate
                                                                      28440
ctggaacatc accagccagg agccataact cctttaggct agcctgcctg caactggatc
                                                                      28500
                                                                      28560
aggtatagca aaaacgattg atctcacctt ctaattttca atgagtggga gtggctgcct
tgagtgctgt gttgggaagg agtctgaggc agcatctgga ccctgtgtaa atatgcgttt
                                                                      28620
cctgttattg atgaagcttt caagacaaga ttttagaaag ctttggctca agttgtaggt
                                                                      28680
tgtgggagga aggaattagt aagagccatc ataaactcaa catctattgt gttccaggag ctgtgaccac tcccttcttt ttagtcggga aggtcaggat ctcactatgt cacctaggct
                                                                      28740
                                                                      28800
agagtgcaat ggtgtgatta ttgctcattg tagtcttgaa tttgaattcc tgggctcaag
                                                                      28860
                                                                      28920
taatcctcct gcctcagcct tctgagtagg tgggactact ggtgtgtgcc accacactcg
gcttactcct ccctttgtat cctgctgcat cgttagtgca tgatacccac cacccctca
                                                                      28980
gaggeceage etagtgetgt eteteagaaa aacaceettt gagteaacag agacaaaett
                                                                      29040
agggggtgcc tgactccaaa gtccaggcct tcctcctttg aggaacagca tggcttcccc
                                                                      29100
agggaatate attecatgga gacaaggeet geagacagat eteattttea tetgttettt
                                                                      29160
```

tactagccct	tggaggattt	gctccaaaaa	cctgaggcac	tgatgtttac	tccagcttta	29220
cttcccccat	acctggtgaa	caactctggc	ccagcttcca	cacaccaagg	cccatggctc	29280
taatagagcc	agagaggcag	tctcagctaa	gaagagctgt	atcctccagg	gaccagcagg	29340
aacttccaga	gatatcctac	aagctccaac	tgctgggaaa	agcagactgg	ggtcttcctc	29400
aggctccacc	aaagatagcc	aagtggcagc	aatgacatga	gcacctcatt	cctgtcctag	29460
accctggcaa	ttccatgaga	gggaggctct	gaattcacct	ctgttcccag	gatgtgtgac	29520
atcaatgcac	attgtcatac	cagatacacc	tgccaaactt	cagaacccct	gggaagtgac	29580
cagaatgcca	ctgaattcaa	caccttagac	caatgaacat	gacctgggtc	ctgtaggata	29640
ggaggcagca	gcagtgtata	cccagacctg	gtcgactcga	atagatctgc	taggcgccaa	29700
gcttgtcagc	cttaccagta	aaaaagaaaa	cctattaaaa	aaacaccact	cgacacggca	29760
ccagctcaat	cagtcacagt	gtaaaaaagg	gccaagtgca	gagcgagtat	atataggact	29820
aaaaaatgac	gtaacggtta	aagtccacaa	aaaacaccca	gaaaaccgca	cgcgaaccta	29880
•	-	aaaacccaca		_	-	29940
acgttacgta	acttcccatt	ttaagaaaac	tacaattccc	aacacataca	agttactccg	30000
	•	gccccgttcc		-		30060
ccctcattat	catattggct	tcaatccaaa	ataaggtata	ttattgatga	tgttt	30115